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TRANS-

TRANSACTIONS

OF THE

LINNEAN SOCIETY.

I. *A Diſſertation on two Natural Genera hitherto confounded under the name of Mantis. By Anthony Auguſtus Henry Lichtenſtein, D. D. F. M. L. S. Tranſlated from the German by Thomas Young, M. D. F. R. S & L. S.*

Read April 4, 1797.

WHEN I firſt took up Fabricius's Syſtem of Entomology, I was much ſtruck with theſe words in the preface:—"The ſcience of entomology is as yet in its cradle: it is ſcarcely ſo far advanced as botany was at the time of Cæſalpinus." I was then inclined to think that this gentleman, whoſe excellent moral character I have only ſince that time had an opportunity, by perſonal acquaintance, to know and eſteem, had at leaſt exaggerated the truth, and done injuſtice to Linné and the reſt of his predeceſſors. But ſince I have had an opportunity of obſerving with accuracy, and of comparing with many deſcriptions and plates, a large number of inſects, chiefly foreign, in the extenſive collection of Mr. Holthuyſen, I am convinced that this great ſyſtematiſt did not, in making that aſſertion, go much too far; for what a maſs of information has been

added to our knowledge of inſects within theſe twenty years by himſelf and other active naturaliſts! And yet we are ſtill very far from having a proper natural arrangement and deſcription of all the orders and genera. I ſhall ſay nothing of the ſpecies; for here, eſpecially through the imperfection and frequent incorrectneſs of the ſynonyms, ſo much confuſion prevails, that it is often difficult to aſcertain to what ſpecies of Linné or Fabricius a perfectly common indigenous inſect belongs. If a genus be truly natural, or, as logicians call it, a *genus proximum*, a ſingle characteriſtic is almoſt always ſufficient to determine with certainty to what ſpecies an individual of this genus is to be referred. The preſent attempt may ſerve as a ſpecimen of the manner in which I conceive that ſtill greater genera ought to be treated according to the natural diſtinctions; fixing the natural genera where the ſyſtem has not already done it, and placing the ſpecies in order under appropriate ſubdiviſions taken from eſſential differences; deſcribing them with accuracy, and particularly adding the ſynonyms as completely and correctly as poſſible.

The idea of ſeparating from the proper *Mantes* thoſe ſpecies feeding on plants, that have no falciform fore-feet, but have all their legs formed for running, and making a new genus of them, is by no means of my invention. Caſpar Stoll has already propoſed it, but has not at all carried it ſyſtematically into effect. The ſplendid work which this zealous entomologiſt had begun to publiſh at Amſterdam in 1787 with a Dutch and French text, under the title of *Natuurlyke, en naar't leeven nauwkeurig gekleurde Afbeeldingen, en Beſchryvingen der Spooken, Wandelnde Bladen, Zabelſpringhanen, Krekels, Trekſpringhaanen en Kakkerlakken*, in quarto, ſold by J. C. Sepp, was interrupted by death, which cut off this gentleman (who, with many peculiarities, had yet undeniably great merit) in the middle of his career. Had he lived longer, this work on the *Ulonata* of Fabricius would

would have been as classical as that for which we are indebted to him on the *Rhynchota*. He would thus have thrown light on all the *Hemiptera* of Linné, and have done as much as a systematic writer for this order of insects, as Pallas has for the unguiculated quadrupeds among the *mammalia*. No one will deny, unless from an absurd prejudice he despise every thing that is Dutch without further examination, that the late Stoll was a very diligent and fortunate observer. His penetrating eye, incredibly experienced and ready in distinguishing objects at first sight, comprehended the whole habit so happily in one fixed point of view, that he discriminated the natural genera as if by internal feeling. The collection of Holthuysen, which he had chiefly arranged, was divided almost universally into the same genera which Fabricius has adopted in his *Entomologia Systematica*. Stoll died before this work was published, and Fabricius saw that collection only cursorily in Hamburgh, when his book was all completed but the appendix. This agreement, therefore, between two persons thinking quite independently of each other, shows clearly that entomology is not so uncertain and inconstant as many believe; and that both of these gentlemen were in search of truth, and knew how to find it. Systematical order, indeed, is not to be expected in the writings of Stoll; for, as he had no learned education, he was totally unprovided with that artificial logic which is more useful to men of letters in general than they often think proper to allow. Although the idea of this monograph was borrowed from Stoll, yet one acquainted with the subject will soon discover that I have not copied from him, but that I have bestowed much labour of my own on this dissertation.

I shall, in the first place, show that the Spectre of Stoll, or the *Phasma*, is truly different from the *Mantis*, and must be separated from it as a distinct genus; in the next place, treat of both in general, going systematically through their species, and ascertaining the synonyms;

then deſcribe at large the ſpecies omitted or newly diſcovered; and, laſtly, enumerate briefly thoſe which I cannot place under their proper genus, becauſe I am only acquainted with them from imperfect deſcriptions.

Stoll ſhows the eſſential difference between the two genera very correctly by the following compariſon of the parts and characteriſtics.

PHASMA. "Laubſchrecke."	MANTIS. "Fangſchrecke."
1. *Antennæ* ſetaceous with longiſh diviſions.	1. *Antennæ* filiform.
2. The *head* large and oval-round; the mouth with moveable jaws and four palpi.	2. The *head* nodding, heart-ſhaped, with jaws and palpi.
3. Small reticulated *eyes* on the forehead.	3. Two large prominent *eyes* on the ſides.
4. Three clear *ſtemmata* in a triangle between the eyes.	4. In moſt ſpecies two clear *ſtemmata* between the roots of the antennæ.
5. The *body* linear, almoſt cylindrical.	5. The *thorax* narrow, on the back ſomewhat carinated, at the margin compreſſed.
6. Six *legs* for running.	6. Six *legs*, the foremoſt with falciform hands, and a thumb of five joints at their ſide; the reſt ſlender and unarmed.
7. The *tarſi* conſiſt of five joints.	7. The *tarſi* have five joints.
8. The *hemelytra* [*decken Flügel*] ſkinny, very ſhort, ſo that they ſcarcely cover a third part of the abdomen. The wings at the external margin membranous, about as long as the abdomen.	8. The *hemelytra* folded croſswiſe together, of the length of the wings beneath them, covering almoſt the whole abdomen.

Beſides theſe diſtinctions taken from the different parts of the body, Stoll appeals, with reaſon, to the remarkable difference of the mode of life. His Spectres, which I name *Phaſmata*, live ſolely on vegetable food. They lay their eggs, like graſhoppers, in the earth, the females being furniſhed with a ſmall ſtile or inſtrument for depoſiting them, of an enſiform figure, and covered by three leaflets, which are found on the laſt diviſion of the abdomen. The *Mantes*, on the contrary, confine themſelves entirely to food taken from the animal kingdom; their falciform hands ſerving them to catch and carry to their mouths flies, and other inſects, which they devour. As to what concerns their procreation and metamorphoſis—they never lay their eggs in the earth, but fix them on a twig, ſtraw, or blade of graſs, and this in rows and regular maſſes, as Roeſel has very correctly deſcribed. *Inſectenbel.* pt. 4. p. 89. ſq. and t. 12. Compare alſo *Merian. Surin. Inſ.* p. 66. *Geoffr. Inſ.* t. 1. p. 399. and *De Geer Inſ.* pt. 3. p. 399.

It will not be ſuperfluous to add ſome remarks which Stoll has omitted, and which ſet the difference between the two genera ſtill more out of doubt. The antennæ of the *Phaſmata* are ſituated on the ſides of the head, far apart, and are inſerted near the eyes: thoſe of the *Mantes*, on the contrary, are placed on the forehead near together, between the eyes. The difference of the organs of feeding I ſhall explain more at large in the ſyſtematic deſcription of the genera. The thorax, in the firſt ſubdiviſion or family of *Phaſmata*, is always extended and cylindrical: ſometimes ſet with little thorns, ſometimes without thorns; but in the ſecond family, which in general more reſembles the *Mantes*, it is ſomewhat flattened, and almoſt marginated. The *Mantes*, on the other hand, have all a more or leſs carinated thorax: all thoſe of the firſt family and ſome ſmall ſpecies of the ſecond family have a roundiſh thorax; but in moſt of the ſecond family

family it is marginated, and in the fore part extended more or leſs in breadth, but behind linear.

The abdomen in the *Phaſmata* differs in different families. Thoſe of the firſt family have a rounded cylindrical abdomen, of ten nearly equal diviſions, which, within its trifoliated extremity, contains a tail in which the parts of generation are concealed. The ſecond family has the abdomen preſſed flat, often even membranous, without any leaflets at the tail. In the *Mantes* the abdomen is very various, but always agrees with the character of the family.

The hemelytra of the *Phaſmata* are often entirely wanting; when preſent they are membranous; in the firſt family, eſpecially in the males, they are very ſhort, taper at the baſe, and toward the middle furniſhed with a ſmall thorn, which is ſometimes blunt, ſometimes ſharp. In the females they are moſtly half as long as the wings, rounded off towards the tips, ribbed, and without thorns. In the ſecond family the males have ſhort and very narrow lancet-formed hemelytra; thoſe of the females are broad, veined, and nearly of the length of the abdomen.

The *Mantes* have tranſparent thin hemelytra, with a broad, membranous, often grooved rib at the outer margin; which are ſeldom ſhorter than the wings or abdomen.

The wings of the *Phaſmata* are broad, inwards plaited and tranſparent, with a broad membranous rib at the outer margin, and ſhorter than the abdomen. In ſome ſpecies of the firſt family, and in the female of the *Phaſma ſiccifolium*, which is of the ſecond family, and has very large and broad hemelytra, they are entirely wanting.

The *Mantes* have tranſparent, often colourleſs wings, more finely plaited, with only a narrow rib at the outer margin, and nearly of the length

length of the abdomen. Only one ſpecies of this genus is entirely without wings.

The legs of the *Phaſmata* are all formed for running, and like to each other; the fore legs are placed ſo near to the head that they are excavated near the baſe to make room for the head between them. This is a very certain natural diſtinction, by which one may know whether even an imperfect ſpecimen is a *Phaſma* or a *Mantis*. The *Phaſmata* of the firſt family have very long and narrow fore feet, frequently with triangular and thorny legs. Thoſe of the ſecond family have ſhorter fore legs, with broad margins.

The *Mantes* have, inſtead of fore legs, arms, with nearly ſciſſor-formed hands; the upper arms and elbows are, according to the families, either narrowly or widely dentated or fringed. The four hind legs are for running; moſtly plain, more rarely adorned with foliated margins on the thighs, and ſtill more rarely on the tibiæ.

This compariſon ſhows ſufficiently that the *Phaſma* and *Mantis* are two very diſtinct genera.

Before I begin the ſyſtematic deſcription in the manner of Fabricius, I muſt ſpeak of the families or diviſions of the genera. The primary diviſions I have taken from Stoll. They depend in both genera on the rounded or more flattened ſtructure of the whole body, with which alſo the length of the fore legs agrees. The *Phaſmata* of the firſt family, that is the rounded ones, I divide again into wingleſs and winged; the flat *Phaſmata* require no further ſubdiviſion.

The *Mantes* of the firſt family, that is, (following the ſame order as in the *Phaſmata*, although Stoll takes them laſt,) the rounded ones, I divide into wingleſs and winged. The laſt again according to their eyes, which are either angular or round. The family of the flat *Mantes* may be ſeparated into two companies; the gouty ones, with leaves on their legs, and the round-legged ones, without them.

Theſe companies I divide, laſtly, according to the eyes, each into two parties; of which the firſt contains thoſe with round eyes, the ſecond thoſe with angular eyes. This apparently trifling minuteneſs or pedantry gives ſo uſeful a thread to guide us to the determination of each ſpecies of phaſma or mantis that occurs, and makes it ſo eaſy to any one who will pay the leaſt attention to inveſtigate if and where ſuch an inſect has been deſcribed, that I do not conſider the time and trouble as loſt which I have ſpent on the diſcovery of theſe ſubtilties. True ſyſtematical proficients in entomology, who love truth and order, will richly repay this *laborem in tenui* by the approbation which they may be pleaſed to beſtow on it. I will not here attempt a prolix vindication of my having been obliged to alter entirely the deſcription of the genus *Mantis*, and compoſe new ones of *Phaſma* and of *Mantis*, nor of the great difference frequently to be found between my deſcriptions of the ſpecies and thoſe of Linné or Fabricius. True judges will themſelves diſcover my reaſons. Such as regard only authority I can aſſure, that Fabricius approves of my innovations. Amateurs and ſharp-ſighted obſervers, who are not fond of the technical and ſcholaſtic language, I refer to Stoll, whom I have accurately quoted; to Füeſſly's *Archives*, and to the Figures which I have here given; but eſpecially to natural ſpecimens. Perhaps many perſons will be reconciled to me on examining a well-ſtored collection, who on the bare reading of the following Latin deſcriptions will have ſhaken their heads, or ſecretly condemned me as an unauthorized pedantic innovator. In theſe inſects the colours often deceive; partly becauſe they are frequently deſtroyed by the ſpirits in which the ſpecimens had at firſt been preſerved; partly, becauſe the hemelytra frequently become ſpotted from thin drops of pus being thrown out and adhering to them when they are ſtuck through with pins. Hence, the *puncta ſparſa elytrorum*, to which one muſt never truſt, unleſs they agree preciſely on both hemelytra. *Sapienti ſat.*

119—20 PHASMA.

119—20. PHASMA.

Palpi inæquales depreſſi; antici quadriarticulati; poſtici triarticulati, articulo extremo longiſſimo, ovato lanceloato.

Labium adſcendens bipartitum, laciniis fiſſis, pinnis æqualibus.

Antennæ ſetaceæ, articulis oblongis.

* *Tertia*, pedibus anticis longiſſimis tenuibus compreſſis.

† *Aptera*. Elytris aliſque in utroque ſexu nullis.

filiforme. 1. P. pedibus anticis inermibus longitudine corporis, antennis nigris.

TAB. I. *fig.* 1.

Mantis filiformis. *Fabric. entom. ſyſtem. t.* 2. *p.* 12. *n.* 1. *Mant. inſ.* 1. *p.* 227. *n.* 1. *Gmel. ſyſt. nat. p.* 2048. *n.* 1.

Small Braſil Quill Locuſt. *Petiver Gazoph. t.* 60. *f.* 2. *Browne Hiſt. of Jamaica, p.* 433. *t.* 42. *f.* 5.

Habitat in America auſtrali et inſulis oppoſitis. Muſeum Ohrtmannianum.

Sequenti adſine ſed multoties minus. Corpus et pedes fuſci teſtaceo annulati. Tarſorum articuli primores

---

Phaſmatis corpus filiforme ſubcylindricum (rarius abdomine depreſſo) glabrum, immarginatum, tardum: capite prominulo magno ovali, latiore quam thorax; oculis parvis reticulatis frontalibus; ſtemmatibus tribus lucidis, in triangulum intra oculos diſpoſitis; antennis diſtantibus lateralibus juxta oculos inſertis; thorace elongato lineari cylindrico, ſcutello nullo; elytris ovalibus parvis (in maribus minimis, baſi ſæpe ariſtatis) membranaceis; alis, coſta lata membranacea, hyalinis plicatilibus, rarius nullis; pedibus ſex, anticis capiti proximis juxta baſin intus emarginatis, omnibus curſoriis, tarſis quinquearticulatis; abdomine ſegmentis decem, ano laminis tribus partes ſexuales abſcondentibus.

reliquis æquales. Synonyma quæ prætermiſi utique excludenda; præſertim *Herbſt. arch. inſ.* 8. *t.* 51. *f.* 2. quæ exhibet larvam alius ſpeciei hujus generis.

Ferula. 2. Ph. pedibus aliquanto corpore brevioribus, tarſorum articulo primo triangulari erecto.

Mantis Ferula. *Fabric. entom. ſyſtem. t.* 2. *p.* 12. *n.* 2.
Arumatia. *Marcgraf Braſil.* 251.
Roeſel inſ. 2. *Gryll. t.* 19. *f.* 10. *Stoll Mant. t.* 13. *f.* 51.

Habitat cum præcedente. Muſeum Holthuyſ.

Deſcriptio Fabricii accuratiſſime quadrat, niſi quod in noſtro exemplari etiam anticorum pedum femora et tibiæ apice ſubſpinoſæ; item color non viridis ſed fuſcus teſtaceo annulatus. Forte quoniam in ſpiritu vini olim ſervatum.

cornutum. 3. Ph. pedibus anticis mediocribus tibiis omnibus muticis, capite oblongiuſculo cornuto oculis prominulis.
Stoll Mant. t. 15. *f.* 57. *et* 57. *t.*

Habitat in America auſtrali. Muſ. Holthuyſ.

Corpus læve glabrum cylindricum, dilute fuſcum; pedes elongati femoribus angulatis.

Calamus. 4. Ph. corpore vireſcente, femoribus ſtriatis.

Mantis Calamus. *Fabric. entom. ſyſt. t.* 2. *p.* 13. *n.* 3.

Habitat in inſula St. Croix. Mihi haud viſum.

Sceleton. 5. Ph. pedibus anticis elongatis, thorace cylindrico ſcabro poſtice attenuato, capite inermi oculis prominulis.
Stoll Mant. t. 14. *f.* 55.

Habitat in Sina. Muſ. Holthuyſ.

Corpus magnum, elongatum, obſcure teſtaceum. Antennæ ſetaceæ mediocres. Pedum tarſi articulo primo

primo triangulari erecto. Adfine præter alarum defectum *Ph. necydaloides* cujus tamen vix larva.

latipes. 6. Ph. pedibus mediocribus foliato compreſſis.
Stoll Mant. t. 14. *f.* 54.
Habitat in Amboina. Muſ. Holthuyſ.
Corpus magnum, elongatum, lineare, teres, fuſcum. Caput ſubrotundum; antennæ breves, oculi prominuli; enſis partumeius (ſive cauda enſiformis) reflexus dentatus.

Plocaria. 7. Ph. corpore viridi, femoribus dentatis.
Mantis Roſſia. *Fabric. entom. ſyſt. t.* 2. *p.* 13. *n.* 4. *Roſſi Faun. Etr.* 1. *n.* 636. *t.* 8. *f.* 1. mas.
Plocaria domeſtica. *Scop. delic. Inſubr.* 1. *p.* 60. *t.* 24. *f.* A. 1—3.
Habitat in Italia. Mihi haud viſum.

†† *Subaptera*, elytris, at alis nullis.

angulatum. 8. Ph. capite thoraceque ſpinoſis, elytris rotundatis breviſſimis, femoribus ſubtus angulatis.
Mantis angulata. *Fabric. entom. ſyſt. t.* 2. *p.* 13. *n.* 5.
Mantis Gigas. *Drury inſ.* 2. *p.* 89. *t.* 50.
Mantis gigantea. *Gmelin ſyſt. nat. edit.* xiii. *p.* 2055. *n.* 49.
Habitat ſecundum Fabricium in Guadeloupe, ſecundum Gmelin in Italia ſuperiori. Mihi haud nota.

††† *Alata.* Elytris aliſque in utroque ſexu.

Gigas. 9. Ph. thorace teretiuſculo ſcabro, elytris planis ovalibus nervoſis, pedibus ſpinoſis.
Mantis Gigas. *Linn. ſyſt. nat.* 2. *p.* 689. *n.* 1. *Muſ. Lud. Ulr. n.* 109.
Mantis Gigas. *Fabric. entom. ſyſt. n.* 6. *Stoll Mant. t.* 2. *f.* 5.

Habitat in Amboina. Muſ. Holthuyſ.

Corpus magnum elongatum, ſupra cylindricum ſubtus complanatum. Caput erectiuſculum inerme ovale, paulo latius quam thorax. Antennæ ſetaceæ mediocres. Oculi parvi, frontales vix prominuli. Thorax antice, ubi pedes primores inferti, ſubdepreſſus et glabellus; medio teres, granulis elevatis ſcaber; poſtice ad baſin elytrorum et alarum terminatus appendicula triangulari ſcutelliformi. Abdomen teres lineare ut in hac tribu ſempex. Elytra brevia, plana, ſpathulato ovalia repanda, nervoſa (item ut alæ maximæ,) obſcure teſtacea fuſco undata. Pedes elongati robuſti ſpinoſi dilutius teſtacei, fuſco annulati.

Omnia exemplaria mihi certe adhuc viſa ſunt ſexus feminini. Utrum *Phaſma hecticum* infra deſcribendum hujus *Ph. Gigantis* mas ſit nec ne, dies docebit; item utrum color naturalis vel in hac ſpecie ſit viridis.

Empuſa. 10. Ph. thorace tereti granulato, elytris brevibus ovatis medio gibbis dente elevato obtuſo, dilute teſtaceis baſi et apice fuſcis, pedibus ſpinuloſis.

Aubent. Miſcell. t. 65. *f.* 1. mala.

Stoll Mant. t. 1. *f.* 1. bona.

Habitat in India orientali. Muſ. Holthuyſ.

Proxime adfine antecedenti at diverſum forma elytrorum et coloribus. Exemplar Holthuyſianum Stollii archetypon eſt corpore fuſco, artubus dilute teſtaceis fuſco undulatis. D'Aubenton exhibet colorem totius inſecti virideſcentem, præter baſes apiceſque elytrorum, ut in noſtro, fuſcos. Forſan ideo, quod ejus exemplar numquam in ſpiritu vini adſervatum fuerat.

Quod

Quod vero idem pedes primores breviſſimos pingit; inde ſequitur, ut vel defuerint in exemplari Lutetiano, vel ſpurii fuerint adglutinati, vel denique ut chalcographus tabulæ anguſtiâ ſe viderit circumſcriptum. Quidquid id eſt, deformat iſthæc præternaturalis pedum brevitas omnem phaſmatis noſtri habitum.

nævium. 11. Ph. thorace cylindrico ſcabro, elytris ovatis angulatis, alis oblongis fuſcis hyalino feneſtratis.

α *Femina.* Mantis necydaloides. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 14. *Amœn. acad.* 6. *p.* 397. *n.* 3.

Mantis necydaloides. *Fabric. entom. ſyſt. t.* 2. *p.* 14. *n.* 7. *Roeſel inſ.* 2. *Gryll. t.* 19. *f.* 9. *Stoll Mant. t.* 3. *f.* 8.

β *Mas.* Mantis cylindrica. *Gmelin ſyſt. nat. edit.* xiii. *p.* 2048. *n.* 54. *Muſ. Leſk. p.* 46. *n.* 12. *Stoll Mant. t.* 4. *f.* 11.

Habitat in Amboina. Muſ. Holthuyſ.

Differt ab antecedentibus, craſſitie corporis baſi elytrorum multo anguſtiore et alis fuſcis hyalino feneſtratis. Mas in hac et ſequenti ſpecie (forſan pluribus quoque in hac tribu) multoties minor quam femina, ſed antennæ robuſtiores.

edule. 12. Ph. thorace tereti (maris ſcabro, feminæ glabro), elytris alarumque coſta læte viridibus, pedibus ſubmuticis.

α *Femina.* *Stoll Mant. t.* 6. *f.* 20. *Houttuyn natuurl. hiſtor. t.* 79. *f.* 1.

β *Mas.* Mantis phthiſica. *Linn. ſyſt. nat.* 2. *p.* 689. *n.* 2. Mantis Jamaicenſis. *Fabric. entom. ſyſt. t.* 2. *p.* 15. *n.* 11. *Gmelin ſyſt. nat. edit.* xiii. *p.* 2054. *n.* 41. *Drury inſ.* 2. *t.* 49. *f.* 1. *Stoll Mant. t.* 6. *f.* 21.

Habitat in India orientali. Muſ. Dom. Holthuyſen.

Corpus

Corpus magnum, præſertim feminæ, quæ adeo craſſior quam *Ph. Gigas*, et teſte Valentino Malaiis pro cibo inſervit. Cf. *Houttuyn. nat. hiſt. p.* 1. *vol.* 10. *p.* 138.

hecticum. 13. Ph. thorace tereti ſcabriuſculo, pedibus angulatis anticis latiſſimis tibiis dentatis, elytris breviſſimis juxta baſin ſpinoſis, alis hyalinis fuſco maculatis.

TAB. I. *fig.* 2.

Habitat in Sina. Muſ. Dom. Holthuyſen.

A Stollio non depictum. Ulteriorem deſcriptionem vide infra.

atrophicum. 14. Ph. thorace quadriſpinoſo, elytris breviſſimis, baſi ariſtato mucronatis.

Mantis atrophica. *Pallas ſpicil. zool. faſcic.* 9. *p.* 12. *t.* 1. *f.* 7. *Fabric. entom. ſyſt. t.* 2. *p.* 14. *n.* 8. *Gmelin ſyſt. nat. p.* 2054. *n.* 38.

Habitat in Java.

Exemplar quod Pallas vidit et deſcripſit fuit mas. Femina adhuc ignota probabiliter eſt aliquoties major, elytris mediocribus ovali-repandis.

Umbretta. 15. Ph. thorace tereti ſcabro, elytris breviſſimis baſi ariſtato ſpinoſis, alis longitudine abdominis.

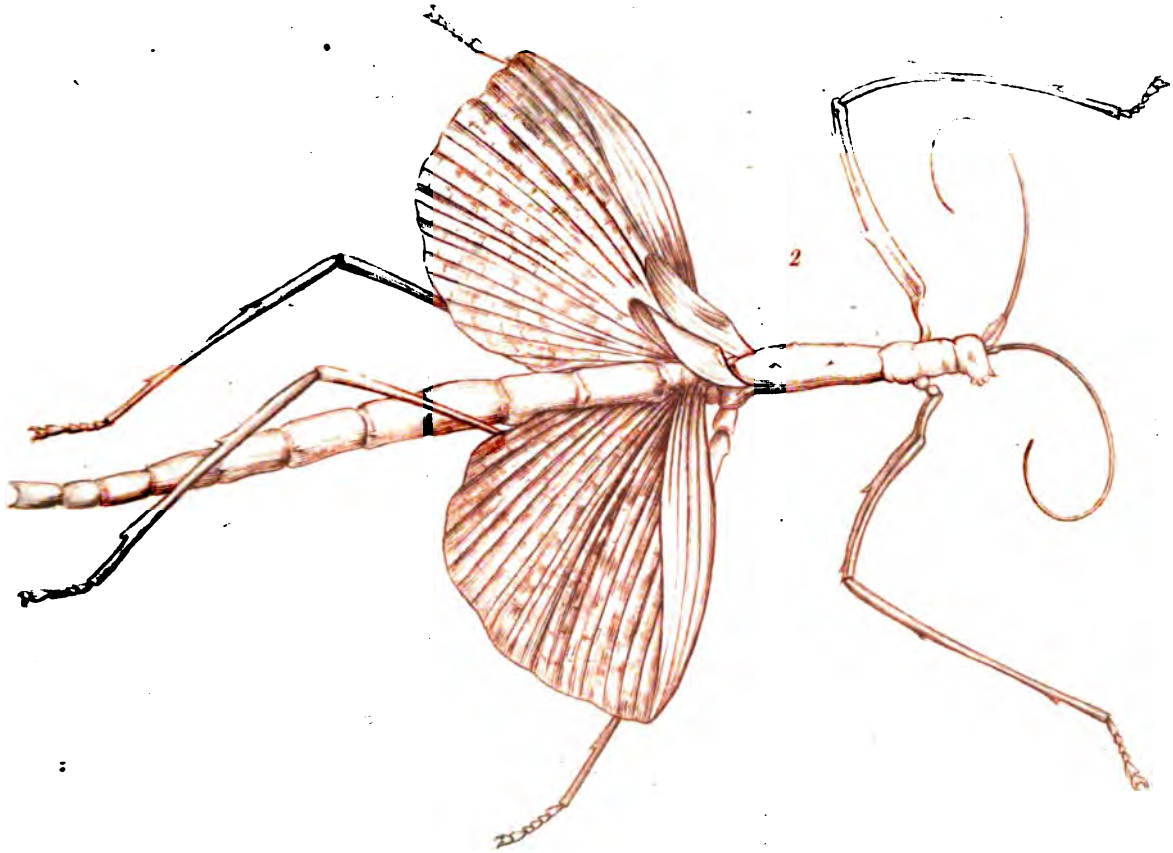
Stoll Mant. t. 8. *f.* 27.

Habitat in Surinamo. Muſ. Dom. Holthuyſen.

Exemplar maſculum. Color totius corporis obſcure fuliginoſus; alæ extus maculis oblongis fuſcis. Antennæ concolores ſetaceæ longitudine corporis. Femina adhuc ignota.

roſeum. 16. Ph. thorace tereti glabro, elytris lanceolatis, alis roſeis coſta viridi.

Mantis



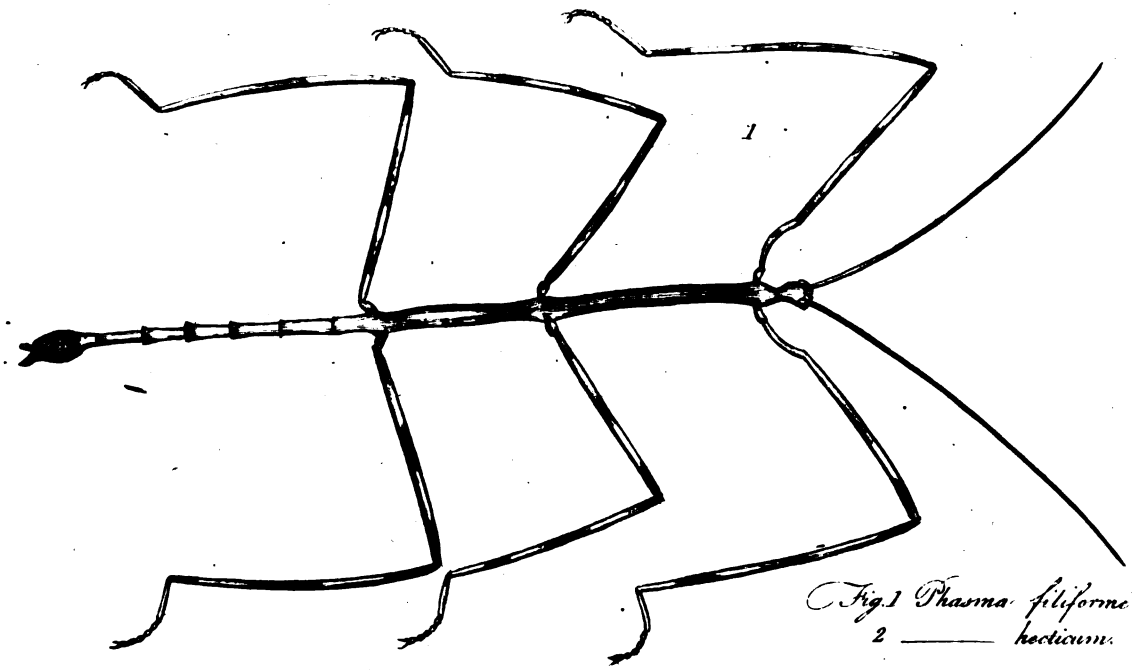


Fig. 1 Phasma filiforme.
2 ——— hecticum.

Mantis roſea. *Fabric. entom. ſyſt. t.* 2. *p.* 16. *n.* 15. *Stoll Mant. t.* 5. *f.* 17.

Habitat in Amboina. Muſ. Dom. Holthuyſen.

Fabricius æque ac Stoll vidit exemplar maſculum, ſed meliùs ſiccatum ideoque viride. Femina adhuc latet.

laterale. 17. Ph. thorace teretiuſculo glabro, pedibus inermibus, corpore nigro, elytris brevibus alarumque baſi ſulphureis.

Mantis lateralis. *Fabric. entom. ſyſt. t.* 2. *p.* 15. *n.* 12. *Gmelin. ſyſt. nat. p.* 2054. *n.* 42. *Stoll Mant. t.* 10. *f.* 36 *et* 37.

Habitat in Indiis. Muſ. Dom. Holthuyſen.

Stoll quidem putat ſe exhibere ambos ſexus, ſed utraque figura videtur maſculina; alioqui magnitudo et elytrorum figura in hac ſpecie pro ſexu parum variaret; quod certe contra analogiam hujus generis.

variegatum. 18. Ph. thorace tereti glabro, elytris breviſſimis ovatis, alarum coſta fuſca, faſciis quatuor ſulphureis.

Stoll Mant. t. 8. *f.* 26.

Habitat in Surinamo. Muſ. Dom. Holthuyſen.

Parvum. Antennæ ſetaceæ breviſſimæ; alæ juxta baſin hyalinæ, coſta latiſſima. Abdomen ſubdepreſſum dilute fuliginoſum. Alter ſexus adhuc latet.

bimaculatum. 19. Ph. thorace tereti glabro, elytris breviſſimis lanceolatis dilute fuſcis, medio macula ſulphurea.

Stoll Mant. t. 8. *f.* 29.

Habitat in Coromandel. Muſ. Dom. de Breukeler Wærth.

Antennæ ſetaceæ longiſſimæ; corpus et pedes dilute fuliginoſi. Alæ hyalinæ, baſi rufeſcentes, coſta dilute fuſca. Femina adhuc latet.

cinereum. 20. Ph. thorace tereti glabro, elytris breviſſimis lanceolatis cinereis fuſco reticulatis, alis dilute cinereis fuſco venoſis coſta rufeſcente.

Stoll Mant. t. 14. *f.* 56.

Habitat in Surinamo. Muſ. Dom. Holthuyſen.

Parvum. Antennæ ſetaceæ breves. Corpus cinereum. Femina adhuc latet.

valgum. 21. Ph. thorace tereti glabro, elytris breviſſimis ovatis, alis hyalinis, femoribus anticis extrorſum divaricatis.

Stoll Mant. t. 13. *f.* 52.

Habitat in Sina. Muſ. Dom. Holthuyſen.

Antennæ ſetaceæ longiſſimæ nigræ: Corpus parvum. Femina adhuc latet.

** *Depreſſa.* Abdomine lato depreſſo; pedibus anticis brevibus, latis, depreſſis; thorace brevi. (Hæc aliquanto ſimiliora mantibus quam antecedentia teretia.)

Dracunculus. 22. Ph. thorace brevi depreſſiuſculo, mutico; elytris viridibus, apice rubris.

Stoll Mant. t. 18. *f.* 65. femina declarata.

t. 5. *f.* 18. feminæ pupa e Muſ. Dom. Holthuyſen, rectius ad ſequentem referenda.

Habitat in Indiis.

Antennæ mediocres ſetaceæ, baſi craſſiores, manifeſto articulatæ, articulis oblongis depreſſis. Alæ cinereæ fuſco undatæ; coſta teſtacea fuſco maculata, apice rubra. Pedum anticorum femora late marginata membranacea.

Forſan Fabricii *Mantis aurita, n.* 13. eſt hujus mas, dummodo

dummodo pedes antici membranacei; id quod ex deſcriptione parum elucet.

Ohrtmanni. 23. Ph. thorace brevi, teretiuſculo, ſub-biarticulato; elytris mediocribus ovato-oblongis; alis rotundatis, abdomine brevioribus; pedibus anticis latiſſimis, omnibus membranaceis, marginato-ciliatis.

TAB. II. *fig.* 1.

Habitat in Indiis. Muſ. Dom. Ohrtmann.

Antecedenti adfine ſed diverſum. Caput antice granulatum, poſtice ſpinoſum, ſpina ſeſquialtera longiore auriformi. Antennæ ſetaceæ longitudine corporis articulis oblongis depreſſis. Thorax granulatus. Abdomen elongatum cylindricum. Elytra juxta baſin integra, neque ut antecedentis emarginata. Alarum coſta concolor griſeo fuſca.

gianicatum. 24. Ph. elytris breviſſimis, baſi denticulo elevato, femoribus anticis membranaceis.

Mantis linearis. *Fabric. entom. ſyſt.* 2. *p.* 16. *n.* 14.

Habitat in India.

Antecedenti proxime adfine atque ejus forte mas. Mihi ex ſola deſcriptione Fabricii notum.

citrifolium. 25. Ph. thorace brevi, antice depreſſo, poſtice obcordato denticulato, femoribus ovatis membranaceis, marginibus denticulatis.

Mantis ficcifolia. *Linn. ſyſt. nat.* 2. *p.* 689. *n* 3.
Muſ. Lud. Ulr. n. 111. *Fabric. entom. ſyſt.* 2. *p.* 18. *n.* 24.
Roeſel inſ. 2. *Gryll. t.* 17. *f.* 4, 5. femina.
Edw. aves, t. 258.
Houttuyn nat. hiſt. p. 1. *vol.* 10. *t.* 79. *f.* 2. femina.

Stoll Mant. t. 7. f. 24. mas. *f. 26.* femina, *f. 25. A.* larva junior. *f. 25. B.* larva adulta. *f. 25. C.* pupa. Omnia ex Muſeo Holthuſiano.

Habitat in Indiis.

Antennæ ſetaceæ mediocres, manifeſto articulatæ, articulis oblongis depreſſis.

Mas minor, anguſtior, alatus: elytris lanceolatis brevibus, viridibus, alis hyalinis, coſta marginali lata vireſcente.

Femina major, lata, aptera: elytris oblongis venoſo-reticulatis viridibus fere longitudine abdominis. Alarum rudimentis nullis.

Caput, antennæ, oculi, pedes in utroque ſexu, item elytra et alæ in maſculis hanc ſpeciem procul dubio generi *phaſma* vindicant; licet uterque ſexus corpore depreſſo, femoribus membranaceis, et ano ſimplici; femininus vero præſertim elytris oblongis abdomen tegentibus naturalem tranſitum faciat ad Mantes.

120. MANTIS.

Palpi quatuor ſubæquales, patuli, laterales teretes, filiformes; *antici* quadriarticulati, articulo extremo breviori acuto; *poſtici* triarticulati, articulo extremo mediocri acuminato.

Labium

Antennæ frontales, approximatæ, pleriſque filiformes in utroque ſexu; rarius pectinatæ vel barbatæ.

* *Teretes.*

Mantis corpus elongatum, plerumque depreſſum, glabrum, immarginatum, tardum: capite exſerto, latiore quam thorax, cordato, declivi; oculis magnis, prominulis, lateralibus; ſtemmatibus plerumque duobus lucidis, intra baſin antennarum; antennis intra oculos

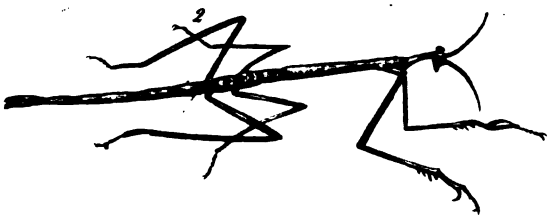


Fig. 1 Phasma Christmanni.
2 Mantis filum.

* *Teretes.* Thorace ſubæquali anguſto, abdomine teretiuſculo; pedibus anticis longiſſimis ſubteretibus, ſpinoſo-ciliatis.

† *Apteræ.* Elytris aliſque in utroque ſexu nullis.

Filum. 1. Mantis corpore filiformi aptero, thorace tereti ſubgranulato, abdomine depreſſiuſculo, brachiis ſubcylindricis, pedibus curſoriis ſetaceis ſimplicibus.

TAB. II. *fig.* 2.

Habitat in Surinamo. Muſ. Dom. Holthuyſen, et Dom. Ohrtmann.

Corpus elongatum lineare, ut phaſma filiforme, ſed duplo minus: caput ſubtriangulare, declive, latius quam thorax: antennæ filiformes breviſſimæ; oculi rotundi laterales prominuli: thoracis pars antica verſus caput attenuata et ſubincurva, quaſi collum mentitur, poſtica longiſſima, haud manifeſto ab abdomine ſecreta: pedes antici per collum a capite remoti forma et uſu brachiorum ut in congeneribus: ulnarum apice ſpinulis tribus. Pedes intermedii breviſſimi, poſticique mediocres capillares teretes mutici. Cauda triphylla foliolis acuminatis. Color totius corporis obſcure teſtaceus; oculi ſoli fuſci.

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oculos inſertis: thorace obovato anguſto (rarius ſtrumoſo), dorſo carinato, margine depreſſo, ſcutello nullo; elytris oblongis ſubmembranaceis, baſi complicatis (dum ſiniſtrum margine interno ſemper incumbit baſi elytri dextri, ut in locuſtis Fabricii) longitudine alarum, rariſſime nullis: alis plicatilibus fere totum abdomen tegentibus: pedibus ſex; anticis brachiiformibus, qui conſtant humeris, ulnis, manibus denique falcatis, pollice laterali filiformi quinquearticulato; reliquis pedibus intermediis nempe et poſticis plerumque teretibus muticis, rarius lobatis; tarſis quinque articulatis: abdomine plerumque ovato, depreſſo, ſubmarginato, rarius teretiuſculo, ſegmentis 8—10, ano ſimplici. Victus e præda animali, quam manibus comprehenſam, ut ſciuri ori admovent, devorant.

†† *Alatæ.* Elytris aliſque in utroque ſexu.

‡ *Dioptricæ*; oculis conico-acuminatis.

oculata. 2. M. corpore filiformi, thorace lineari ſubcarinato, elytris dimidio brevioribus quam abdomen.

M. bicornis. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 11.
Muſ. Lud. Ulr. n. 116.
M. oculata. *Fabric. entom. ſyſt.* 2. *p.* 19. *n.* 26.
Stoll Mant. t. 10. *f.* 38.
Habitat ad Cap. bon. ſpei. Muſ. Dom. Holthuyſen.
Mantis fauſta. *Fabric. entom. ſyſt. n.* 47.
Thunberg nov. inſ. ſp. 3. *p.* 63.
Stoll Mant. t. 13. *f.* 53. vix ac ne vix quidem ab hac ſpecie ſecernenda videtur.
Hottentottos hanc pro numine tutelari adorare pernegat Sparrmannus.

‡‡ *Boopides.* Oculis ſimplicibus, rotundis, prominulis.

leptelytra. 3. M. thorace lineari elongato, ſubdepreſſo, marginato; elytris anguſtis longitudine abdominis, hyalinis coſta viridi; alis hyalinis, coſta fuſco maculata; apice dilute fuſca.
Stoll Mant. t. 5. *f.* 16.
Habitat in Surinamo.
Antennæ mediocres filiformes, pedes graciles et, præter ulnas ciliatas, mutici.

purpuraſcens. 4. M. thorace lineari; elytris alarumque coſta dilute fuſcis; alis purpuraſcentibus, maculis quatuor cæruleis.
Stoll Mant. t. 8. *f.* 28.
Habitat in Surinamo.

Habitus.

Habitus phaſmatis ſed certiſſime mantis. Sequenti adfinis attamen diverſa.

picta. 5. M. thorace lineari, elytris alarumque coſta et apice fuſcis; alis hyalinis, juxta coſtam quinque maculis alternis, tribus purpureis, duabus dilute flavis.

Stoll Mant. t. 3. f. 9.

Habitat in Surinamo.

** *Depreſſæ.* Thoracis baſi vel medio latiore. Abdomine ovato depreſſo; manibus, femoribus tibiiſque compreſſis; tibiis tarſiſque anticis ſpinoſo-dentatis.

† *Arthriticæ.* Pedibus lobatis.

‡ *Boopides.* Oculis ſimplicibus rotundis prominulis, thorace elongato filiformi.

gongylodes. 6. M. thorace antice dilatato dentato; elytris repandis coſta viridi, longioribus quam alæ hyalinæ; femoribus anticis ſpina, reliquis lobo terminatis.

M. gongylodes. *Linn. ſyſt. nat. 2. p. 690. n. 4.*

Muſ. Lud. Ulr. n. 112. Amæn. acad. 1. p. 504.

Fabric. entom. ſyſt. 2. p. 17. n. 17.

Aldrov. inſ. t. 13. f. 21.

Marcgraf Braſil. 246. Gaayra.

Act. angl. 301. t. 20. f. 3.

Seb. muſ. 4. t. 68.

Roeſ. inſ. 2. gryll. t. 7.

Sulzer char. inſ. t. 8. f. 50.

D'Aubent. miſc. t. 65. f. 2.

Drury inſ. 1. t. 50. f. 2.

Stoll Mant. t. 16. f. 58, 59.

Habitat

Habitat in Indiis. Muſ. Dom. Holthuyſen.

Antennæ breves filiformes; capitis vertex ſubulatus bifidus; ulnæ dilatatæ ciliatæ; femora introrſum lobo ſimplici ſemicordato, extrorſum duplici aculeato, ſtipitata; tibiæ teretes; elytra et alæ breviores quam abdomen.

ſtabellicornis. 7. M. thorace antice dilatato, ſubbidentato; elytris repandis longitudine alarum; antennis pectinatis.

M. ſtabellicornis. *Fabric. entom. ſyſt.* 2. *p.* 16. *n.* 16. *Stoll Mant. t.* 17. *f.* 61.

Habitat in Indiis. Muſ. Dom. Holthuyſen.

Proxime antecedenti adfinis. Differt modo antennis pectinatis; alis longioribus quam abdomen; et oculis minus prominulis. Lobi femorum exacte ut in M. *gongylode.* Quare olim forſan recte a Fabricio (*ſpec. inſ.* 1. *p.* 346. *n.* 8.) pro eadem ſpecie habita eſt.

pectinicornis. 8. M. thorace antice unidentato, elytris integerrimis hyalinis coſta viridi, alis hyalinis coſta fuſca, antennis barbatis.

M. pectinicornis. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 10. *Amœn. acad.* 6. *p.* 396. *n.* 27. *Fabric. entom. ſyſt.* 2. *p.* 18. *n.* 25.

M. pennicornis. *Pallas it.* 2. *app. n.* 81. *Gmelin ſyſt. nat. p.* 2055. *n.* 53.

M. pectinicornis. *Herbſt. arch. inſ.* 8. *t.* 50. *f.* 2. *Stoll Mant. t.* 9. *f.* 34. mas. *f.* 35. femina.

Habitat prope mare Caſpium. Muſ. Dom. Holthuyſen.

Mas multo minor, thorace mutico; femina thorace ciliato; antennis ulniſque latioribus. Femora in utroque

utroque ſexu ſolummodo gaudent introrſum lobo ſimplici ſemicordato ſubterminali. Tibiæ teretes. In ſynonymia fortaſſe paſſim confuſio cum antecedente latet, ob neglectas elytrorum et femorum differentias.

lobipes. 9. M. thorace antice ſubdilatato mutico; elytris aliſque hyalinis, coſta ſtriiſque obliquis viridibus.

(M. undata. *Fabric. entom. ſyſt.* 2. *p.* 19. *n.* 28. videtur hujus femina.)

Stoll Mant. t. 8. *f.* 30. mas.

Habitat in Tranquebar. Muſ. Dom. Holthuyſen.

Caput triangulare; frons producta in conum erectum; antennæ filiformes breviſſimæ; oculi exſerti. Brachia robuſta manuſque ut in tribulibus hujus generis femora et tibiæ utrinque lobis ſemicordatis ſtipitatæ; tibiæ item ſpina ſubterminali. Elytra et alæ aliquoties longiores quam abdomen. Fabricius in deſcriptione M. *undatæ* videtur uſus fuiſſe femina hujus noſtræ *lobipedis*, quæ colorum detrimentum cepit e ſpiritu vini.

mendica. 10. M. thorace antice marginato, ciliato; elytris albo viridique variis, coſta guttis albis adſperſa.

M. mendica. *Fabric. entom. ſyſtem.* 2. *p.* 17. *n.* 19.

Stoll Mant. t. 12. *f.* 47.

Habitat in Africa boreali.

Caput triangulare, frons parumper producta, antennæ pectinatæ. Thorax pro hac tribu brevis. Femora ſola introrſum lobo ſemiovato ſubterminali.

foliata. 11. M. thorace mutico, elytris viridiſſimis; poſticorum pedum femoribus intus, tibiis utrinque lobatis.

Stoll Mant. t. 18. *f.* 67.

Habitat in Bengala.

Caput triangulare, frons parumper producta. Antennæ breves filiformes. Oculi exſerti. Elytrorum baſis interior, alæque hyalinæ. Pedes intermedii teretes.

pauperata. 12. M. thorace ſpinuloſo; humeris extus ſpina, femoribus intus lobo ſemicordato terminatis.

Fabric. entom. ſyſtem. 2. *p.* 17. *n.* 18. *Thunberg nov. inſ. ſpec.* 3. *p.* 61.

Herbſt. arch. inſ. 8. *t.* 51. *f.* 1. femina.

Stoll Mant. t. 10. *f.* 40. mas.

Habitat in Coromandel.

Adfinis M. pectinicorni, at neutiquam ejus femina, namque eſt multoties minor. Differt præterea antennis in utroque ſexu filiformibus brevibuſque, thorace parum dilatato, elytris integerrimis viridibus flavo marginatis, et lobis intus modo ad femora adnatis.

bidens. 13. M. thorace ſcabro, elytris viridibus faſciis nigris, alis fuſcis diſco atro.

M. bidens. *Fabric. entom. ſyſt.* 2. *p.* 22. *n.* 39.

Habitat in America.

Mihi ſolummodo ex Fabricii deſcriptione nota.

‡‡ *Dioptricæ.* Oculis conico acuminatis, thorace brevi lobato.

coronata. 14. M. thorace cordato, marginato; oculis oblongis porrectis; femoribus intus late lobatis.

Stoll Mant. t. 11. *f.* 44. *Ibid. f.* 44. item ejus larva.
Habitat in Amboina.

Antennæ filiformes mediocres. Quintuplo major quam ſequentes.

lobata. 15. M. thorace cordato marginato, elytris maculis binis quadratis albis.

M. lobata. *Fabric. entom.* 2. *p.* 23. *n.* 45.
Thunberg nov. inſ. ſpec. 3. *p.* 62. *f.* 73.
Stoll Mant. t. 12. *f.* 50.
Habitat ad Cap. bon. ſpei.

Sequenti ſimillima, at paulo major. Ulnæ anguſtæ ſubmuticæ.

naſuta. 16. M. thorace cordato ciliato, fronte porrecta ſpinoſo-emarginata.

M. naſuta. *Fabric. entom. ſyſt.* 2. *p.* 23. *n.* 44.
Stoll Mant. t. 9. *f.* 33. *et t.* 12. *f.* 48.
Herbſt arch. inſ. 8. *t.* 51. *f.* 4. Mantis tricolor. Pupa.
Habitat ad Cap. bon. ſpei. Muſ. Dom. Holthuyſen.

Antecedente paulo minor; abdominis margo lobato dentatus, lobis recurvis; brachiorum ulnæ latiores dentato ciliatæ.

†† *Eucnemides.* Femoribus tibiiſque ſimplicibus.

‡ *Boopides.* Oculis prominulis rotundis.

cancellata. 17. M. thorace dilatato, margine membranaceo plano; elytris ovalibus cancellatis.

M. cancellata. *Fabric. entom. ſyſt.* 2. *p.* 18. *n.* 23.
Stoll Mant. t. 11. *f.* 42.
Habitat in Surinamo.

M. Strumariæ adfinis, ſed differt: antennis breviſſimis, thoracis margine plano, elytris ovalibus ferrugineis fuſco cancellatis, medio macula ſubocellari teſtacea.

ſtrumaria. 18. M. thorace obcordato dilatato, margine ſubcucullato, elytris lanceolatis pellucidulis.

M. ſtrumaria. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 13.
Fabric. entom. ſyſtem. 2. *p.* 18. *n.* 21.
Merian. Surin. t. 27.
Seb. Muſ. 4. *t.* 69.
Roeſ. inſ. 2. *Gryll. t.* 3.
Stoll Mant. t. 12. *f.* 45.
Habitat in Indiis. Muſ. Dom. Holthuyſen.
Antennæ filiformes elongatæ.

precaria. 16. M. thorace elongato ſubciliato, elytris ovatis acuminatis vireſcentibus, ocello ferrugineo.

M. precaria. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 8. *Fabric. entom. ſyſt.* 2. *p.* 20. *n.* 32.
Merian. Surin. t. 66.
Seb. Muſ. 4. *t.* 67.
Houttuyn nat. hiſt. p. 1. *vol.* 10. *t.* 79. *f.* 3.
De Geer inſ. 3. *p.* 407. *n.* 3. *t.* 36. *f.* 4.
Herbſt arch. inſ. 8. *t.* 50. *f.* 1.
Stoll Mant. t. 17. *f.* 62.
Habitat in America. Muſ. Dom. Holthuyſen.
Antennæ filiformes mediocres; elytra ovata, acuminata; nunc ocello ferrugineo ſimplici, nunc dimidiato albo, nunc macula ſubocellari alba.

hodegetica. 20. M. thorace elongato ſubciliato; elytris ovatis acutis, viridibus immaculatis; alis hyalinis fuſco undatis.

M. carolina. *Linn. ſyſt. nat.* 2. *p.* 691. *n.* 9.

Amæn. acad. 6. *p.* 396. *n.* 28.

Habitat in Surinamo. Muſ. Dom. Holthuyſen.

Antennæ filiformes breves. Ulnæ intus macula magna atra.

irrorata. 21. M. thorace lævi ſubcarinato, elytris viridibus, punctis ferrugineis ſparſis.

M. irrorata. *Linn. ſyſt. nat.* 2. *p.* 690. *n.* 7. *Amæn. acad.* 6. *p.* 397. *n.* 29. *Fabric. entom. ſyſt.* 2. *p.* 19. *n.* 29.

Habitat in America auſtrali.

Antecedenti proxime adfinis, neque ab illa forſan tamquam peculiaris ſpecies diverſa. Puncta ſparſa elytrorum fortaſſis a ſanie, dum inſectum acu occideretur, emicante orta, ut in noſtra *M. conſpurcata.*

cingulata. 22. M. thorace elongato ſubciliato, elytris lanceolatis viridibus, nigro maculatis; alis nigricantibus nigro lineatis, coſta ex fuſco flaveſcente.

M. cingulata. *Gmelin ſyſt. nat. ed.* 13. *p.* 2055. *n.* 48.

Drury inſ. 2. *p.* 89. *t.* 49. *f.* 2.

Stoll Mant. t. 9. *f.* 32.

Habitat in America auſtrali. Muſ. Dom. Holthuyſen.

Antennæ filiformes mediocres. Abdomen nigro cingulatum.

urbana. 23. M. thorace elongato ſubciliato, elytris ovalibus viridibus, faſcia punctiſque ferrugineis. *Fabric. entom. ſyſtem.* 2. *p.* 23. *n.* 42. mas.

Stoll Mant. t. 9. *f.* 31. femina.

Habitat in Indiis. Muſ. Dom. Holthuyſen.

Mas multo minor quam femina differt thorace integro.

Simulacrum. 24. M. thorace ſubelongato, ciliato; elytris oblongis viridibus macula media alba.

M. Simulacrum. *Fabric. entom. ſyſtem.* 2. *p.* 21. *n.* 34.

Stoll Mant. t. 12. *f.* 49.

Habitat in Indiis. Muſ. Dom. de Breukelerwærth.

Antennæ filiformes longæ; thorax paulo brevior et antice latior, quam in tribulibus.

obſecraria. 25. M. thorace elongato lævi; elytris ſpathulatis hyalinis, coſta viridi; ocello rubro, dimidiato albo; alis hyalinis.

Stoll Mant. t. 18. *f.* 66.

Habitat ad Cap. bon. ſpei. Muſ. D. de Breukelerwærth.

Antennæ filiformes mediocres. Ulnæ intus macula nigra. *M. oratoriæ* adfinis, attamen diverſa.

oratoria. 26. M. thorace elongato lævi, elytris viridibus immaculatis.

M. oratoria. *Fabric. entom. ſyſt.* 2. *p.* 20. *n.* 31.

α mas. Mantis religioſa. *Linn. ſyſt. nat.* 2. *p.* 690. *n.* 5.

Roeſ. inſ. 2. *Gryll. t.* 1. *f.* 1, 2.

Schæf. elem. t. 81.

Seb. Muſ. 4. *t.* 67. *f.* 7, 8.

Stoll Mant. t. 5. *f.* 19.

β femina. M. oratoria. *Linn. ſyſt. nat.* 2. *p.* 690. *n.* 6.

Roeſ. inſ. 2. *Gryll. t.* 2. *f.* 5. *item inſ.* 4. *t.* 12.

Sulz. hiſt. inſ. t. 8. *f.* 4.

De Geer

De Geer inſ. 3. *p.* 410. *n.* 5. *t.* 37. *f.* 2. hic delenda, nam eſt *M. ſanĉta*, quod vel magnitudo docet.

Seb. Muſ. 4. *t.* 67. *f.* 9, 10.

Stoll Mant. t. 17. *f.* 64.

γ ſtriata. M. ſtriata. *Fabric. entom. ſyſtem.* 2. *p.* 20. *n.* 30.

Roeſ. inſ. 2. *Grylli. t.* 2. *f.* 6.

Habitat ubique in Zona torrida et temperata.

Mas antennis longioribus; thorace breviore. Femina alis apice viridibus.

conſpurcata. 27. M. thorace carinato ciliato, elytris ſpathulatis hyalinis, coſta ſubrepanda viridi, (punctis ferrugineis ſparſis.)

Stoll Mant. t. 16. *f.* 60. *ib. t.* 4. *f.* 12. pupa.

Habitat in Coromandel. Muſ. Dom. Holthuyſen.

Adfinis *M. oratoriæ*, at paulo major; antennæ filiformes mediocres. Thorax manifeſto ciliatus. Puncta ſparſa videntur a ſanie, dum occideretur, orta.

griſea. 28. M. thorace latiuſculo; oculis prominentibus; elytris aliſque griſeo hyalinis, fuſco maculatis.

M. griſea. *Fabric. entom. ſyſt.* 2. *p.* 22. *n.* 40.

Stoll Mant. t. 6. *f.* 23.

Habitat in Coromandel.

Statura mediocris. Caput quale Agrii virginis, at majus. Antennæ filiformes mediocres. Corpus artuſque griſei, fuſco punctati. Elytra oblonga, coſta ſubrepanda.

ochroptera. 29. M. thorace lævi, elytris oblongis teſtaceis, macula laterali fuſca.

De Geer inſ. 3. *t.* 36. *f.* 8?

Stoll.

Stoll Mant. t. 6. *f.* 22. pupa? *t.* 4. *f.* 13. larva?

Habitat in Coromandel. Adhuc dubia ſpecies.

adſperſa. 30. M. thorace ciliato; elytris aliſque longis griſeis fuſco maculatis.

Stoll Mant. t. 11. *f.* 41.

Habitat in Africa æquinoctiali.

Similis *M. precariæ*, ſed minor. Elytra alæque oblonga integerrima.

hyalina. 31. M. thorace ciliato, elytris hyalinis margine viridi, fronte bidentata.

M. hyalina. *Fabric. entom. ſyſt.* 2. *p.* 21. *n.* 37.

De Geer inſ. 3. *p.* 410. *n.* 4. *t.* 37. *f.* 1.

Habitat in America.

Nimis adfinis videtur *M. oratoriæ*.

monacha. 32. M. thorace lævi, elytris aliſque viridi hyalinis.

M. monacha. *Fabric. entom. ſyſt.* 2. *p.* 21. *n.* 35.

Stoll Mant. t. 1. *f.* 2. mas.

Habitat ad Cap. bon. ſpei.

Similis *M. precariæ*, ſed duplo minor.

ſancta. 33. M. thorace ferrulato, elytris viridibus immaculatis, alis hyalinis.

M. ſancta. *Fabric. entom. ſyſtem.* 2. *p.* 21. *n.* 33.

De Geer inſ. 3. *t.* 37. *f.* 2. Mantis oratoria.

Habitat in Europa auſtrali.

Similis *M. precariæ*, at triplo minor. Elytra oblonga integerrima. Alæ apice vireſcentes.

faſciata. 34. M. thorace ſubcarinato lævi; elytris oblongis integerrimis

rimis dilute fuſcis; alis cinereis fuſco undatis, faſcia lata purpurea juxta baſin hyalinam.

Stoll Mant. t. 18. *f.* 68.

Habitat in Surinamo.

Similis *M. purpuraſcenti*; ſed hujus tribus. Antennæ filiformes mediocres. Thorax elongatus vix marginatus, ſed ſubcarinatus nec linearis. Elytra alæque longitudine abdominis.

truncata. 35. M. thorace lævi; elytris integerrimis; alarum apice exalbido; abdomine depreſſo, margine lobato.

M. truncata. *Fabric. entom. ſyſt.* 2. *p.* 17. *n.* 20.

Stoll Mant. t. 3. *f.* 10.

Habitat in America auſtrali.

Parva ſed robuſta. Abdomen faſciis fuſcis cingulatum. Elytra puncto diſci fuſco.

neuroptera. 36. M. thorace lævi, antice tereti; elytris aliſque hyalinis, fuſco venoſis.

Stoll Mant. t. 12. *f.* 46.

Habitat in Ceylon.

Elytra et alæ fere, ut neuropteris v. c. Hemerobiis, longiores quam abdomen. Attamen certiſſime hujus generis et tribus.

Confer M. perſpicua *Fabric. entom. ſyſt. n.* 48. cui ſimillima præter maculas: item

M. parva *Gmelin p.* 2055. *n.* 47. *Drury inſ.* 2. *p.* 75. *t.* 39. *f.* 5.

caffrana. 37. M. thorace lævi, antice tereti, poſtice marginato; elytris viridibus, ſulphureo marginatis.

Stoll Mant. t. 11. *f.* 43.

Habitat:

Habitat ad Cap. bon. ſpei.

Proxime adfinis *M. ſanctæ.*

praſinana. 38. M. thorace depreſſo, ſubcarinato, lævi; elytris brevibus acutis; alis abdomine longioribus nigris apice flaveſcentibus.

Stoll Mant. t. 1. *f.* 4.

Habitat in Surinamo.

Corpus parvum viride. Elytra brevia, medio linea elevata fuſca, fere ut Phaſmatis; ſed caput, thorax et brachia Mantin arguunt. Pedes poſtici teretes tenuiſſimi.

minuta. 39. M. thorace elongato teretiuſculo, elytris hyalinis coſta vireſcente.

Fabric. entom. ſyſtem. 2. *p.* 24. *n.* 50.

Stoll Mant. t. 2. *f.* 7.

Habitat in America auſtrali. Muſ. Dom. Holthuyſen.

Parva. Caput cordatum oculis lateralibus. Antennæ filiformes breves. Pedes antici a reliquis diſtantes capiti approximati. Elytra et alæ viridi hyalinæ.

pagana. 40. M. thorace teretiuſculo, elytris aliſque reticulatis albis, priorum coſta macula laterali ferruginea.

Fabric. entom. ſyſtem. 2. *p.* 24. *n.* 49.

Raphidia Mantiſpa. *Linn. ſyſt. nat.* 2. *p.* 916. *n.* 2.

Raphidia ſtiriaca. *Pod. Muſ. Græc.* 101. *t.* 1. *f.* 15.

Mantis Perla. *Pallas ſpicil. zool. faſc.* 9. *p.* 14. *t.* 1. *f.* 8.

Stoll Mant. t. 2. *f.* 6.

Habitat in Gallia, Germania.

Parva. Caput cordatum oculis lateralibus. Brachia capiti approximata. Thorax brevior quam antecedentis; vix carinatus, integerrimus.

puſilla.

puſilla. 41. M. thorace teretiuſculo lævi, elytris aliſque oblongis integerrimis hyalinis, priorum coſta flaveſcente.

Fabric. entom. ſyſtem. 2. *p.* 25. *n.* 51.

Pallas ſpicil. zool. faſc. 9. *p.* 15. *t.* 1. *f.* 9.

Stoll Mant. t. 1. *f.* 3.

Habitat ad Cap. bon. ſpei.

Parva, vix major quam *Raphidia Ophiopſis.*

nana. 42. M. thorace teretiuſculo elongato, elytris aliſque hyalinis fuſco venoſis, abdomine longioribus.

Stoll Mant. t. 4. *f.* 15.

Habitat in Coromandel.

Antecedenti adfinis, attamen diverſa. Abdomen vix depreſſum; brachia capiti approximata. Corpus rufum; elytrorum coſta anguſta rufeſcens.

‡‡ *Dioptricæ*; oculis conico-acuminatis.

angulata. 43. M. thorace mediocri, elytris ſinuato-repandis, abdomine lobato.

Stoll Mant. t. 4. *f.* 14.

Habitat in Surinamo. Muſ. Dom. Holthuyſen.

Corpus mediocre at robuſtum ferrugineum. Caput cornutum vertice bifido. Antennæ filiformes mediocres. Thorax cinereus ſubcarinatus elongatus lævis. Abdomen rufo-faſciatum, marginatum lobis ciliato-dentatis. Brachia ut in congeneribus. Pedes curſorii ſimpliciſſimi, lobis nullis; quum reliquæ Mantes depreſſæ dioptricæ omnes quoque ſimul arthriticæ reperiantur, vel hoc nomine, ut alioque ſpecies maxime ſingularis.

This may be ſufficient for the nomenclature of the two genera which I have taken the liberty to name in German *Blattſchrecke*, or *Laubſchrecke*, and *Fangſchrecke*. It is unneceſſary to repeat here all that I have ſaid in Latin; I will only make a few general remarks, eſpecially on the ſpecies omitted by Fabricius. In the *Entomologia Syſtematica* we find in all 51 *Mantes*; I here deſcribe 25 *Phaſmata* and 43 *Mantes*, together 68 ſpecies; hence it might be concluded, that I had 17 new ſpecies; but this mode of reckoning is not perfectly ſure: it may be, and is, indeed, the fact, that I have added more than 17 ſpecies. The deſcriptions of Fabricius are very good and correct, but they are frequently inſufficient to determine to which family a *Mantis* belongs, and, therefore, I cannot always be certain whether this or that ſpecies delineated by Stoll, where I do not cite Fabricius, may not yet be found in the *Entomologia Syſtematica*. But this will be very rarely the caſe, and nearly all the ſpecies of Fabricius, which I paſs over in the monograph, are certainly wanting in Stoll.

Every one acquainted with the ſubject will obſerve, that the firſt 15 *Mantes* of Fabricius are one and all *Phaſmata*. A certain proof that the difference of the habit ſtruck alſo the attention of this ſharp-ſighted entomologiſt. The *Phaſma citrifolium* alone has gone aſtray among the *Mantes*, under the name of *M. ficcifolia*, *n.* 24. This has been occaſioned partly by its belonging to a peculiar family, which has rather more reſemblance to the *Mantes* than the other *Phaſmata*, and partly from this circumſtance, that Fabricius was acquainted only with the female, and not with the male, which bears much ſtronger marks of a *Phaſma* than the female. Three ſpecies of *Phaſma* occur in Fabricius which Stoll has not, and which I have heſitated to number in the order of ſpecies. Not that I doubt their exiſtence, but becauſe they are males, and I cannot be certain that the female is not already reckoned among the ſpecies. They

are

are the following, *M. ſpinoſa*, *n.* 9. *M. biſpinoſa*, *n.* 10. and *M. aurita*, *n.* 13. This laſt is, in all probability, the male of the *Phaſma Dracunculus*, provided it has broad forelegs, and in general ſkinny margins on all its legs, which may eaſily be determined by inſpection of the Lundian collection in Copenhagen. The next in order, *Ph. lineare*, is certainly at leaſt of the ſecond family, and, probably, the male of my *Ph. Ohrtmanni*. The *Ph. ſpinoſum* and *biſpinoſum* belong certainly to the firſt family, and are very nearly related to the *Ph. atrophicum* and *hecticum*. The laſt mentioned are alſo males, of which the females are, perhaps, already known. In the genus *Phaſma*, the males in general are very clearly diſtinguiſhable from the females. The ſexual diſtinctions may be taken with the greateſt advantage from thoſe ſpecies of which the males and females are known with perfect certainty as belonging to each other. Theſe are particularly my *Ph. nævium* and *Ph. edule*. There are, indeed, ſome genera in which it ſeems that the difference of the ſexes in reſpect to magnitude is only obſervable in ſome ſpecies, and not in the genus at large. I need not go ſo far as to mention that in the genus *Cervus*, the ſtag, *Cervus Elaphus*, is greater than the hind; and, on the contrary, the roebuck, *Cervus Capreolus*, is conſiderably ſmaller than the doe; ſuch conſiderations would carry me too far from my purpoſe. I will confine myſelf to inſects. Here we have the *Bombyx diſpar*, in which an inequality exiſts between the two ſexes that may be called unexampled in this genus. It were uſeleſs to aſſert that there is a natural genus among the *Gloſſata* of which the ſexes are unequal in ſize, and which ought to be ſeparated from the genus *Bombyx*, in the ſame manner as the *Lucani*, where the ſexes are of unequal magnitudes, are ſeparated from the more proportionate *Paſſali*. Yet, ſetting aſide all theſe minutiæ, we may aſſume it as a probable hypotheſis, until the contrary be clearly proved, that the differences of moſt, if not of all, the other ſpecies of

Phaſma, with reſpect to ſex, are analogous to thoſe of the *nævium* and *edule*. This being granted, we may obſerve that, 1. The males are always much leſs than the females. 2. Their antennæ are proportionably longer and thicker. 3. Their hemelytra are ſmaller, round-oval, ſharper at the tip, thorned at the baſe; thoſe of the females larger, oval, rounded off at the tip, without thorns, but more ſtrongly ribbed. 4. The females of ſome ſpecies are, perhaps, without wings, although they have hemelytra, and the males have really wings. The *Phaſma citriſolium* of the ſecond family, and the *Ph. angulatum* of the firſt, afford examples of this. It is not impoſſible that ſome females may be found to want both wings and hemelytra, whoſe males may have both. At the ſame time, there are certainly ſome males without wings in the perfect ſtate. The *Ph. filiforme* in the Ohrtmannian collection is, without doubt, a male, full grown, and yet without any wings. Time will ſhow whether or not this *Ph. filiforme* be the male of the *Ph. Ramulus*. 5. The head and thorax of the male *Phaſma* are more thorny than thoſe of the female. 6. The female *Phaſmata* have, between the three leaves at the end of the abdomen, a proper ſpine for laying eggs; the male organs, concealed in a ſimilar poſition, are in dried ſpecimens not to be clearly diſtinguiſhed. 7. The forefeet of the males are in proportion longer, thinner, and dentated with fewer but ſtronger thorns.

Theſe obſervations may be of uſe in bringing together the ſexes of the ſame ſpecies, and may ſerve to guide and aſſiſt a reader, who has an opportunity of obſerving theſe inſects alive, to throw more light on their economy and procreation. But, on the other hand, they render difficult the determination of the ſpecies. The ſpecific characters ought properly never to be taken from the particulars juſt mentioned, as they hardly ever agree perfectly in both ſexes. I have ſought as much as poſſible to avoid this error in the deſcription of the

the ſpecies, of which I knew both the male and the female. Where I could aſcertain but one ſex, whether in a natural ſpecimen, or in a drawing or deſcription of good authority, I have been obliged, againſt my own principles, to form the ſpecific characters from thoſe variable diſtinctions which are ſubject to change with the difference of ſex. In this reſpect, therefore, whoever ſhall hereafter think proper to write a more complete and accurate monograph on the *Phaſmata*, will find ſtill much room left for corrections and improvements. I conſider myſelf as excuſed in the eyes of enlightened judges, as having been able to make uſe only of dried ſpecimens and books; and, beſides, as fairly confeſſing and pointing out the defects of my ſpecific characters, and recommending them to the improvements of thoſe who have opportunity of examining the living ſubjects.

In the genus of the proper *Mantes*, the difference between the two ſexes is far from being ſo ſtriking as in the *Phaſmata*. I believe that I have obſerved in ſome ſpecies the following ſexual characters, which I do not lay down dogmatically, but propoſe, as a critical reaſoner, to be brought to the teſt by thoſe who have opportunity and ſkill to make uſe of them. 1. The male *Mantes* are only a little ſmaller than the females. 2. Their antennæ are conſiderably longer, and ſomewhat thicker, ſometimes, although rarely, even pectinated. Thus, perhaps, the *M. flabellicornis* may be the male of *M. gongylodes*; on the other hand, both ſexes of the *M. pectinicornis* ſeem to have pectinated antennæ. 3. The males have proportionably larger eyes than the females; in reſpect to form and ſituation, the eyes of each ſex agree of courſe very exactly. 4. The thorax of the males is narrower, and, eſpecially at the margin, ſmoother. 5. Their abdomen is narrower and thinner. 6. Their hemelytra are narrower, and often longer. 7. Their wings are longer, and every way larger. 8. Their arms are ſomewhat longer; the upper and lower arm narrower, and leſs flattened; the ſciſſar-like, or falciform hand, narrower

and longer; the thumb rounder and longer. The females are proportionately the reverſe in all theſe reſpects, that is, the whole form is heavier, broader, flatter, and firmer. The proper organs of generation of the *Mantes* do not, in dried ſpecimens, admit of examination.

From this digreſſion on the ſexual differences in both genera, I return to the account which I propoſed to give.

In Gmelin's thirteenth edition of the *Syſtema Naturæ* the *Phaſmata* ſtand as in Linné, intermixed with the *Mantes*. But we find ſome enumerated amongſt them that Fabricius has not. The *M. cylindrica*, *n.* 54. is doubtleſs the male of *M. necydaloides*. I have united both under *Ph. nævium*. *M. phthiſica* is probably the male of my *Ph. edule*. *M. labiata* is alſo a *Phaſma*, but I can ſay nothing further of it. *M. gigantea* is our *Ph. angulatum*, as I rather chooſe to call it after Fabricius; it is this ſpecies deſcribed from a female.

I now come to the proper *Mantes*. I muſt here enumerate the following from Fabricius, which I have been obliged to omit, not being able to aſcertain to which family they belong. 1. *M. ſuperſtitioſa* of that author, *n.* 27. appears to belong to the *Mantes* with a flattened body, rounded feet, and round eyes, and in my ſeries to come in between *M. ſtrumaria* and *precaria*. 2. *M. feneſtrata*, *n.* 38. appears to claim a place in the ſame family and party. 3. *M. bidens*, *n.* 39. belongs to my arthritic diviſion with round eyes, between *lobipes* and *mendica*. 4. *M. ruſtica*, *n.* 43. muſt, according to analogy, be alſo arthritical; and in that caſe it follows *M. pectinicornis*. 5. *M. fauſta*, Fabr. *n.* 47. is ſcarcely a ſpecies eſſentially different from the *M. oculata*. 6. *M. perſpicua* muſt be placed directly after my *neuroptera*.

The following *Mantes* of Gmelin I am quite at a loſs to arrange, as I have no ſufficient accounts to enable me to aſcertain their family and relationſhip with any certainty. 1. *M. maculata*, *n.* 45.

2. *M. capenſis*, *n.* 46. 3. *M. anguſta*, *n.* 50. 4. *M. ſibirica*, *n.* 51. and 5. *M. brachyptera*, *n.* 52.

The new ſpecies, which I here deſcribe for the firſt time, with the addition of coloured plates, are the following:

1. *Phaſma hecticum*, TAB. I. *fig.* 2.
2. *Phaſma Ohrtmanni*, TAB. II. *fig.* 1.
3. *Mantis Filum*, TAB. II. *fig.* 2.

The *Phaſma hecticum*, which is an inhabitant of China, I deſcribe from a ſpecimen in the collection of Mr. Holthuyſen; it is of the male ſex, and reſembles the *Phaſma Gigas*; but does not ſeem to be the male of that ſpecies, although its female muſt be of the ſize of the *Ph. Gigas*.

The head is oblongo-ovate, highly vaulted, and covered with a ſhagreen-like ſkin. The forehead is elongated into a ſharp porrected horn, which is excavated in the middle with a deep furrow; the margins are bent round and ſerrato-dentated. It conſiſts of two leaflets, compreſſed from the ſides, which the inſect, when alive, can probably ſeparate at pleaſure from each other, and move either of them apart. The organs of feeding are of the ſame nature with the others of this genus and family. The eyes are ſituated under the forehead, and are ſmall, round, and black. The antennæ are ſetaceous, originate between the eyes, and have, at the baſe, two thick diviſions; the reſt are longiſh, and become, by degrees, narrower and narrower.

II. *The Botanical History of the Genus Ehrharta.* By Olof Swartz, M. D. F. M. L. S.

Read January 7, 1800.

AMONG the numerous botanical acquisitions made upwards of twenty years ago by Professor Thunberg during his extensive peregrinations in the southern part of Africa, was a kind of grass, whose difference from all before known, occasioned him to consider it as a peculiarly distinct genus. It was afterwards described and delineated by him in the Memoirs of the Swedish Royal Academy for 1779, *p.* 216. *t.* 8. under the name of *Ehrharta*, in honour of F. Ehrhart, native of Berne in Switzerland, once a pupil of the elder Linnæus, and His Britannic Majesty's botanist at Hanover; a man of great merit in the science of botany, and who is well known by his labours, particularly in the history of grasses and the cryptogamous tribe.

The same year this genus was adopted amongst the *Nova Graminum Genera*, arranged in a dissertation under the presidency of the younger Linnæus at Upsala.

In the mean time, the Abbé Rozier published in his Journal de Physique, 1779, *p.* 225. a botanical description made by L. Richard, of a kind of grass called by him *Trochera striata*, of which, notwithstanding the indifferent figure he has given, it is not difficult to perceive the near affinity with the former.

Several years afterwards the President of the Linnæan Society described in the first fasciculus of his *Plantarum Icones hactenus inditæ*, *t.* 9.

t. 9. a new ſpecies, under the name of *Ehrharta panicea*, detected in the year 1776 by Sonnerat, at the Cape of Good Hope.

In the ſecond faſciculus of the ſame valuable work, the author enriches the genus *Ehrharta* with two other ſpecies, the *E. longiflora* and *E. calycina*, the latter of which had, ſome time before, appeared in the Linnéan *Suppl. Plantarum*, *p.* 108. where it is called *Aira capenſis*.

But the great external ſimilarity of this genus with that of *Melica*, has made me anxious to examine, with the leave of my highly eſteemed friend Prof. Thunberg, into ſeveral of thoſe ſpecies preſerved in his muſeum, which we find not only inliſted in the *Suppl. Plant.* under the generic names of *Melica* and *Aira*, but even thoſe inſerted in the firſt part of his own *Prodr. Floræ Capenſis*; and to my very great ſatisfaction, I have had the good fortune to detect ſome poſſeſſing all the characteriſtic marks of the genus in queſtion. I am happy to acknowledge my high obligations to Prof. Thunberg, by whoſe generous communications I have thus been able to attain a tolerably complete knowledge of ſeveral beautiful kinds, which will ſtill more help to ſettle the limits of this moſt diſtinct genus, and become ſo many cypreſſes round the urn of a man untimely loſt for ſcience, whoſe name will be preſerved by them in the annals of botany.

Having now had the opportunity of ſtudying and comparing ſo many ſpecies, I venture to offer more accurate characters to form the natural and genuine difference of the *Ehrharta* from other genera of the ſame natural order, the character hitherto given in the *Suppl. Plant.* and in the above-mentioned diſſertation, being rather a ſpecific deſcription of the only ſpecies on which this new genus was firſt founded.

Habitus generis naturalis.

Radix fibroſa l. rarius bulboſa.

Culmi conferti, ſimplices l. ſubdiviſi, ſubinde ramoſi, articulati, ſubgeniculati,

niculati, erecti, l. verſus radicem decumbentes, ſtoloniferi; in quibuſdam ſuffruteſcentes.

Folia ut in gramineis baſi vaginantia, diſco plana, apice interdum convoluta; margine cartilaginea ſcabra l. crenulato-undulata.

Vaginæ arctæ, fauce contractæ, liguliferæ.

Panicula terminalis, ſimpliciuſcula, contracta l. patens.

Flores mutici l. ariſtati.

Glumæ calycinæ ſæpius coloratæ.

Character genericus.

CAL. *Gluma* uniflora, bivalvis.

Valvulæ corolla ſæpius breviores, ovatæ, acutæ, concavo-canaliculatæ, muticæ, patentiuſculæ, inæquales.

exterior plerumque minor, ovato-lanceolata, interiorem baſi amplectens.

interior parum major, lato-ovata, acuta.

COR. *Gluma* duplex, calyce longior, ſubclauſa.

Exterior bivalvis.

Valvulæ complicatæ, compreſſæ, amplexantes inæquales, ſæpe baſi uno alterove faſciculo villorum præditæ.

interior anguſtior, baſi utroque latere exciſa.

exterior latior, ante floreſcentiam maximam partem interioris obvolvens, infima baſi interiorem ſubtus (articulatione quaſi) excipiens.

Interior anceps, bivalvis.

Valvulæ complicatæ, membranaceæ, carinatæ inæquales.

exterior latior, baſi ad latera exciſa glumæ oppoſitæ corollæ exterioris illam amplectens.

interior ſubulato-falcata.

Ad baſin *interioris*, verſus valvulam interiorem glumæ corollinæ exterioris

exterioris, inſidet *tuberculum* ſeſſile, ſubrotundum, inæquale; forſan rudimentum floſculi.

Nectarium. Petala s. membranulæ 2. minima, baſi craſſiuſcula, apice tenuiſſima; genitalia obvolventia.

STAM. *Filamenta* 6. breviſſima, circa germen inſerta. *Antheræ* lineares, erectæ, baſi emarginatæ, apice bifidæ, biloculares: *loculis* apice oblique hiantibus.

PIST. *Germen* ovatum, minutum, glabrum. *Styli* duo, breviſſimi, erecti, contigui. *Stigmata* longa, conniventia, demum divergentia, compreſſo-bijubata.

PER. nullum; ſed valvulæ coroll. perſiſtentes includunt

SEMEN unicum glabrum.

Character eſſentialis.

CAL. *Gluma* bivalvis uniflora.

COR. *Gluma* duplex, utraque bivalvis; *exterior* baſi exciſa.

From the above generic character it appears—that the *glumæ corollinæ* being joined at the baſe by a kind of hinge or articulation, the interior of the exterior *corolline glumes* is emarginated at the ſides of the baſe, or has on each ſide a ſemilunar cavity;—that a *rudimentum floſculi* is commonly found at the baſe between the two interior corolline valves; but in thoſe ſpecies where this rudiment is wanting, a *ſquama petaloidea* is ſeen in its place on both ſides, where the interior valve is emarginated;—that the filaments are not inſerted in a parallel manner on two ſides of the germen, but ſurround it; the *antheræ*, however, concealed within the compreſſed glumes of the corolla, are placed three on each oppoſite ſide of the *piſtillum*;—that the *antheræ* open only at the top at the time of fœcundation;—and finally, that the *Styles* are invariably two, and the *Stigmata bijubata.*

This genus ought accordingly, in the ſexual ſyſtem, to take its place in *Hexandria digynia*, immediately after *Oryza*, it having been erroneouſly placed in the order *monogynia*; of this I ſhall have occaſion to ſay more hereafter. With reſpect to its natural order, it belongs to the *Gramineæ*, like the *Oryza*, *Zizania* and *Pharus*, with which it agrees in number of ſtamina,—a number unuſual among the graſſes.

As to the habit of the ſpecies in general, they approach particularly that of the *Melicæ*, although quite different in the number and the diſpoſition of the glumes.

The natural place of growth of this genus, as far as we yet know, is only near the ſouthernmoſt part of Africa, commonly called the Cape of Good Hope.

As there are ſpecies with *Ariſtæ* as well as without them, I have thought it moſt convenient in the following ſcientific deſcriptions, to divide the *Ehrhartæ* into *Muticæ* and *Ariſtatæ*.

* *Muticæ.*

1. EHRHARTA mnematea.

E. glumis corollinis exterioribus rugoſis obtuſis (muticis); panicula ſimplici laxa, culmo indiviſo; foliorum margine cartilagineo criſpo.

E. mnemateia, foliis vaginatis criſpis, corolla rugoſa obtuſa. *Thunb. prodr. fl. Cap. p.* 66.

E. capenſis, *Act. Holm.* 1779, *p.* 216. *t.* 8. *Nova plant. gen. Upſ.* 1779. *Linn. ſuppl.* 209. *Syſt. nat. ed. Gmel.* I. *p.* 549.

E. cartilaginea, culmo indiviſo, panicula ſimplici, corolla exteriore retuſa ſubmutica, foliorum margine cartilagineo-criſpo. *Smith icon. plant. ined.* II. *t.* 32.

E. nutans. Lamarck encycl. ſp. 1.

DESCR.

DESCR. *Radices* filiformes, longæ, ſimplices, rigidæ, erumpentes ſub *bulbo* ſupra radicali glabro luteſcente, vaginis foliorum radicalium ſubimbricatis ſtriatis emarcidis tecto.

Culmus erectus, ſimplex, ſubbipedalis, remote articulatus (articulis circiter quinque) folioſus, craſſitie culmi *Triciti repentis.*

Folia inferiora s. radicalia longiora, palmaria, ſuperiora breviora, ſubenſiformia, erecta, marginata, margine cartilaginea, criſpa, l. crenulata, diſco læviuſcula, ſubtus nervoſo-ſtriata, baſi in vaginis contractis deſinentia, fauce reflexo nigro. *Ligula* minuta albida membranacea ciliata intra faucem inſerta culmumque cingens.

Panicula erecta, ſimplex, ſubflexuoſa; *pedunculi* bini ternique, laxiuſculi, capillares, inferiores 2—3 flori, ſub floribus incraſſati, ſæpeque colorati.

Flores magni, cernui, flavo-purpuraſcentes.

Calyx bivalvis.——*Valvulæ* ſubæquales, ſubovatæ, acutæ, concavæ, leviter carinatæ, patentes, membranaceæ, vix nervoſæ, totæ glabræ, dorſo et baſi fuſco purpuraſcentes. *Interior* paulo major latiorve, *exteriore* baſi amplexa.

Gluma corollina duplex, mutica, calyce longior.

Exterior acinaciformis, bivalvis.

Valvulæ complicatæ, compreſſiuſculæ, oblongo-lanceolatæ obtuſæ, baſi paullulum exciſæ.

exterior elongato-obovata, latior, carinata, dorſo leviſſime recurvata, lateribus inferne coſtatis et rugoſis, marginibus ſuperne ſubconvolutis; apice carinaque (oculo armato) ſcabriuſcula ſubhiſpida; faſciculis duobus villorum albiſſimorum extus baſin, unus ſupra alterum inſertis, ſæpe pallide violacea.

interior

interior anguſtior, linearis, acumine breviſſimo vix incurva, obtuſe carinata, tota rugis tranſverſis elevatis notata, margine ſubciliata, pallescens; ad utrumque latus baſeos carinæ hiſpidulæ faſciculo villorum prædita.

Interior bivalvis.

Valvulæ inæquales, complicatæ, glaberrimæ, membranaceæ, pallide vireſcentes.

exterior ovato-lanceolata obtuſa, emarginata, dorſo imprimis carinata; nervoſa.

interior multo anguſtior, lanceolato-falcata, dorſo bicarinata, margine tenuiſſima, albida.

Inter baſin hujus et interiorem corollæ exterioris, *tuberculum* ſoſſile, minutum, inæquale.

Nectarium. Petala bina, minuta, obovata, erecta, baſi flaveſcentia, ſuperne tenuiſſima albida, margine lacero-ciliata, genitalia amplectentia.

Filamenta ſex breviſſima s. longitudine nectarii, circa baſin germinis inſerta, alba. *Antheræ* erectæ, lineares, longitudine glumæ interioris corollæ, baſi emarginatæ, apice bifido extrorſum pollen emittentes; luteæ.

Germen ovato-compreſſiuſculum, glabrum. *Styli* duo, filamentis breviores latiuſculi compreſſi, conniventes. *Stigmata* longitudine antherarum erecta, vix divergentia, compreſſo-bijubata s. pilis diſtichis longiuſculis albido-ſplendidis ornata.

Semen ovatum, glabrum, glumis corollinis incluſum.

This beautiful graſs is diſtinguiſhed by its *acinaciform* or ſcymitar-ſhaped flowers, and its leaves being more cartilaginous and undulated at their edges than in any other known ſpecies. Though the culm is not ſo long as in many other ſpecies, the flowers ſurpaſs moſt of them in ſize. That the root, though provided with fibres, is at the ſame

time bulbous, is a circumſtance, I believe, hitherto not attended to. Truth obliges me alſo to declare that the *Ehrharta mnemutea*, or *Capenſis*, is not monogynous, but really digynous. The miſtake, however, was eaſily made, becauſe the ſtyles are very ſhort, and the long ſtigmas in the compreſſed valves ſtick cloſe to one another, and appear as one, like a plume with four margins, and is called by Linnæus *quadrijubatum*, fourmaned; but on a nearer ſcrutiny, by the help of a pin, it may be divided down to the top of the germen.

Thunberg found this plant in the graſſy regions about *Swellendam*, and in other places at the Cape.

2. EHRHARTA panicea.

E. glumis corollinis exterioribus glabris ſubrugoſis obtuſis; panicula ſubramoſo ſecunda; culmo ſubdiviſo.

E. panicea, culmo diviſo, panicula ſubramoſa, floribus erectis digynis. *Smith pl. ined.* 1. *t.* 9.

E. erecta. Lamarck encycl. ſp. 2.

DESCR. *Radices* longiſſimæ, ſimpliciuſculæ, filiformes, fibrillis lateralibus brevibus, ex albido-fuſcæ.

Culmi cæſpitoſi, 1—2—3 pedales, geniculati, inferne decumbentes, ſubadſcendentes, ad genicula (præſertim inferiora) ſubdiviſi, quaſi ramoſi, tereti-compreſſiuſculi, glaberrimi, ſtriatuli, folioſi.

Stolones tereti-ſubulati albidi vaginati e radicibus ad baſin culmorum emiſſi.

Genicula majuſcula, glabra.

Folia 2—6 pollicaria et ultra, lineari-lanceolata, acuta, erecta, longitudinaliter ſtriata glabra; margine integra leviter undulata ſcabriuſcula, oculo armato cartilagineo-ſerrulates; juniora pubeſcentia, læte virentia.

Vaginæ

Vaginæ foliorum compreſſæ culmum arcte cingentes, *ore* membranaceæ ciliatæ; *ligula* albo-membranacea, ſemitubuloſa, laciniato-ciliata, intra faucem inſerta.

Paniculæ terminales, erectiuſculæ, laxæ, ſubramoſæ. *Pedunculi* capillares, ſuperiores ſimplices, erecti, alterni; inferiores terni ſecundi, quorum duo elongati, horizontaliter patulo-deflexi, *pedicellis* 1—2 linearibus, ſub floſculis incraſſatis, pubeſcentibus, unifloris.

Flores erecti, virides, polygami.

Calyx bivalvis. *Valvulæ* ovatæ, concavæ, ſubcarinatæ, obtuſæ, glabræ, virides, apice membranaceæ purpuraſcentes, exteriore majore.

Gluma corollina exterior mutica, calyce parum longior. *Valvulæ* complicatæ, oblongæ, concavæ, obtuſæ, compreſſiuſculæ, margine membranaceæ, dorſo (oculo armato) cartilagineo-ſerratæ baſi nudæ; ſubæquales. *Exterior* lævis, baſi triquetra; *interior* leviter coſtata, baſi pubeſcens nec villoſa, valde exciſa; lateribus inter coſtas tranſverſaliter rugoſis.

——*interioris* valvulæ complicatæ, carinatæ; *exterior* parum latior, glaberrima, 5-nervia, viridis, *interiorem* minorem, teneriorem, bicarinatam, albidam, amplectens.

Tuberculum minutum ovatum ad baſin inter valvulas corollinas interiores.

Nectarii petala duo minutiſſima, obovata retuſa erecta, plana integerrima, genitalia includentia.

Stam. 6. longitudine valvularum. *Filamenta* breviſſima. *Antheræ* lineares, baſi apiceque emarginatæ, biloculares, luteæ, apice extrorſum hiantes, polliniferæ.

Germen ovatum, glabrum, baſi attenuatum. *Styli* duo, ſta-

minibus

minibus breviores, divaricati. *Stigmata* albida, bijubata: pilis longis.

Semen oblongum, compreſſiuſculum, baſi oblique attenuatum, glabrum, ſemidiaphanum; valvulis cor. incluſum.

Alii floſculi monoici, hermaphroditis in eadem panicula mixti.

Maſc. Piſtillum abortiens.

Fem. *Filamenta* longiſſima, capillaria abſque antheris, circa piſtillum fertile.

Dr. Smith deſcribed this ſpecies after a dried ſpecimen in the collection of his friend Thouin at Paris. Having myſelf cultivated the ſame for ſome years, it has been in my power to add a little to the ſpecific deſcription. From the manner of growing of this kind, as well as of others examined in the herbarium of Thunberg, it ſeems that, producing many ſhoots or runners from the roots, they form graſſy turfs. What has appeared to me moſt ſingular in the *E. panicea* is, that the lowermoſt peduncles of the panicle lean horizontally towards one ſide, or downwards. The flowers are, perhaps, the ſmalleſt of the genus. The lateral wrinkles (rugæ) of the exterior corolline valves alſo indicate an affinity to the foregoing, whoſe flowers they reſemble in form. Their likeneſs, however, to ſome of the *panicum* genus certainly juſtifies the ſpecific name given by Dr. Smith.

3. EHRHARTA ramoſa.

E. glumis coroll. exterioribus ſcabris retuſis; panicula coarctata; culmo ramoſiſſimo ſuffruteſcente.

Melica ramoſa, corollis glabris muticis, panicula coarctata, culmo ramoſo. *Thunb. prodr. p.* 21. *Sp. pl. ed. Wild. p.* 383.

Ehrharta digyna, foliis planis, corollis lævibus obtuſis coſtatis. *Ibid. p.* 66.

DESCR. *Culmus* 3—4-pedalis, erectus, glaber; inferne craſſitie pennæ anſerinæ, ſubſolidus, rigidus, ramoſiſſimus, ſeu ad articulos nodoſus, ubique dichotome ſubdiviſus, ramis teretibus ſubgeniculatis ſtriatis glabris vaginatis.

Folia inferiora vaginantia concava lanceolata, s. potius vaginæ inferiores bipollicares, culmum ramoſque baſi cingentes, uſque ad articulum apertæ, ſtriatæ, glabræ, virides.

Superiora, s. ramorum terminalium, linearia, apice erecto convoluta, baſi longiſſime et arcte vaginantia.

Paniculæ terminales, erectæ, coarctatæ, ſimplices, rarius ramoſæ, bi- tri-pollicares.

Pedunculi 2—4 lin. longi, 2—3, conferti, inæquales, uniflori.

Flores oblongo-lanceolati, obtuſi, erecti, albeſcentes, glabriuſculi.

Calycis valvulæ ſubæquales, ovato-lanceolatæ, acutæ, concavo-carinatæ, muticæ, glaberrimæ, nitidæ.

Gluma coroll. vix longior calycis, intra calycem pedicellata.

Exterioris valvulæ ſubæquales, carinatæ, lanceolatæ ſubretuſæ, lineis elevatis notatæ (coſtatæ Thunb.) oculo armato ſcabris, carinaque ciliata; albidæ, apice extimo plerumque fuſcæ; *exterior* faſciculo pilorum ad baſin dorſo inſerto; *Interior* baſi utroque latere valde exciſa, faſciculis pilorum duobus, ſquamuliſque ſemilunaribus minutiſſimis albidis lateralibus adpreſſis. (Forte rudimenta floſculorum.)

interioris valvulæ inæquales, glaberrimæ, carinatæ; *exterior* glumæ exteriori ſimillima, ſed tota carinaque glabra; *in-*

terior

terior minor, tenerrima, acutiuſcula, diaphana, apice ſubciliata.

Tuberculum inter valv. inter. in hac ſpecie deeſt.

Nectarium: Petala cuneiformia, retuſa, integra, genitalia amplectentia, albida.

Filamenta 6, breviſſima. *Antheræ* lineares, minutæ, flavæ, apice pollen emittentes.

Germen ovatum. *Styli* duo, divergentes, glumis breviores. *Stigmata* congenerum, albida.

This kind is not leſs diſtinct in its flowers than in the rigidity of its branching culm, which, about the articulations, is almoſt ligneous. The panicles at the top of all the branches, being generally undivided, have more the appearance of *racemi*. The flowers ſomewhat reſemble thoſe of the *Feſtuca decumbens*, and are quite bare, with a calyx as long as the corolline valves, and frequently (not always) diſtinguiſhed by dark tips. Thunberg, probably induced by the outward reſemblance of the flowers, made this ſpecies a *Melica*; but being in poſſeſſion of another, though leſs perfect, ſpecimen, (which he did not ſuppoſe to be the ſame with his *Melica ramoſa*,) and having in that found the flowers correſponding with the character of *Ehrharta*, he again inſerted it in the *Prodr. fl. Cap.* under the appellation of *Ehrharta digyna*.

Thunberg met with this graſs in a valley diſtant from the Cape, called by the Dutch *Zoetemelks-valley*.

4. EHRHARTA melicoides.

E. glumis corollinis exterioribus glaberrimis obtuſis, panicula patentiſſima.

Melica Capenſis, corollis glabris muticis, panicula patentiſſima, foliis ſubfiliformibus. *Thunb. prodr. Cap. p.* 21. *Spec. plant. ed. Wild. p.* 383.

DESCR. *Culmus* erectus, inferne geniculatus, teres, ſtriatus, glaber. *Articuli* pubeſcentes, albidi.

Folia linearia, acuta, longiuſcula, erecta, ſtriata, glabra, margine cartilagineo ſcabra. *Vaginæ* arctæ. *Ligula* ſubnulla.

Panicula erecta, pedalis, ramoſa.

Pedunculi patentiſſimi, ſubdiviſi, 3—4nis, capillares, purpuraſcentes; *pedicellis* tenuiſſimis longiuſculis laxis flexuoſis, ſub floribus incraſſatis, coloratis.

Flores ovati, *E. paniceæ* vix majores.

Calycis valvulæ æquales, dorſo obtuſe carinatæ, oblongæ, leviter acutæ, ſubnervoſæ, glaberrimæ, baſin verſus rubro s. violaceo-coloratæ.

Gluma corollina mutica, tota glabra, nitens, pallide virens.

Exterioris valvulæ oblongæ, obtuſæ, vix compreſſæ, dorſo convexæ, inæquales: *exterior* 3plo minor; *interior* magnitudine calycis, baſi exciſa, cum ſquamulis lateralibus albidis.

Interioris valvula *exterior* magnitudine glumæ exterioris majoris, oblonga, obtuſa, glaberrima; *interior* minuta, lanceolata, tenerrima, albida.

Nectarii petala ſubrotunda, retuſa, albida ad latera germinis.

Filamenta 6, breviſſima. *Antheræ* lineares, longitud. corollæ interioris, flavæ, apice bifido polliniferæ.

Germen ovatum. *Styli* duo, breves. *Stigmata* priorum, albida.

This ſpecies has ſtill more reſemblance to a *Melica*, but the deſcription above ſhows its true genus. None of the former has ſuch bare and rounded corolline glumes. It diſtinguiſhes itſelf at firſt ſight by the very diffuſe panicles, more evidently ſubdivided than in the other kinds. There can ſcarcely be a doubt that this has been confounded with the following:

5. EHR-

5. EHRHARTA calycina.

E. glumis corollinis exterioribus ſubpiloſis obtuſis cum acumine brevi; panicula coarctata ſimpliciuſcula; culmo ramoſo.

E. calycina, culmo ramoſo, panicula ſubſimplici, calyce colorato corollam æquante. *Smith ined. faſc.* II. *t.* 33.

Aira capenſis, culmo ramoſo, floribus racemoſis, corollis piloſis. *Linn. ſuppl. p.* 108.

DESCR. *Radices* capillares, filiformes, ſimplices, longiſſimæ.

Culmi cæſpitoſi, 2—3-pedales, ſubdiviſi vel ſubramoſi, inferne geniculati, teretes, glabri.

Folia linearia acuta, bi- ſex- pollicaria, erecta, ſtriata, margine ſcabra (oculo armato ſubciliata).

Vaginæ ſtriatæ, fauce coarctatæ, ſubinde ciliatæ; *Ligula* minuta, erecta, membranacea, albida, multifido-ciliata.

Panicula erecta, ſimpliciuſcula, coarctata, ſemipedalis; *pedunculis* binis, ternis s. quaternis, capillaribus, rectis, ſubſecundis, inferioribus 2—3—4-floris; pedicellis apice incraſſatis.

Flores erectiuſculi, plerumque purpuraſcentes, *E. paniceæ* duplo majores, plerique hermaphroditi, pauci feminei ſtaminibus carent.

Valvulæ calycinæ ſubæquales, longitudine fere corollæ, exteriore parum anguſtiore, lanceolatæ, obtuſe carinatæ, oblique retuſæ, ſtriatæ, ſcabriuſculæ vel glabræ, ſæpe violaceo s. pallide purpureo-coloratæ vel albidæ.

Valvulæ coroll. exterioris inæquales, carinatæ, extus piloſæ, obtuſæ ſubretuſæ cum brevi acumine. *Exterior* anguſtior, linearis, vix brevior; *interior* duplo latior, apice compreſſa, baſi parum exciſa, abſque villis, ſed ſquamulis minutiſſimis lateralibus.

Valvulæ interioris ſubæquales, carinatæ; *exterior* rarius piloſa; *interior* tenerrima.

Nectarii petala integra, rotundata, albida.

Filamenta 6. *Antheræ* erectæ, flavæ, utrinque bifidæ, apice polliniferæ.

Germen ovale, glabrum. *Styli* duo, breves. *Stigmata* pallida, bijubata, patula.

Semen oblongum, valv. coroll. incluſum.

Feminei in eadem panicula, quorum

Germen ſetis 4—6 longis rigidis albidis intra nectarium cingitur (forſan ſtam. ſterilia).

Varietas hujus ſpeciei occurrit:

Culmis filiformibus, foliis anguſtioribus.

Floribus albidis, minoribus.

Calycibus non coloratis, glabris.

Glum. cor. exter. valvula exteriore minuta, interiore obtuſa, inter pilos ſubruguloſa.

The deſcription is ſcarcely more than a copy of the very good one already given by Doctor Smith, and proves this plant undoubtedly different from the genus of *Aira*. By comparing ſeveral ſpecimens of the ſame, I have added ſomething to the illuſtration of the ſpecies. The exterior corolline glumes, though obtuſe, are uſually terminated towards the back in a very ſhort point, often ſcarce viſible to the naked eye. The colour of the calycine and corolline glumes is ſometimes alike in both, particularly in the variety above mentioned. The calyces are beſides more or leſs coloured in moſt of the ſpecies. The hairineſs of the corolline valves is alſo various, but always to be ſeen, at leaſt by the aſſiſtance of the microſcope. The pointed exterior corolline glume, the whole compreſſed *floſculus*, as well as

the appearance of the panicle, make this kind very diſtinct from the *E. melicoides* juſt deſcribed.

Sterile male filaments are likewiſe found here as in the *E. panicea*, in ſeparate flowers from the hermaphrodite. Dr. Smith has alſo obſerved the ſame. There may, perhaps, be ſomething analogous in all the ſpecies of the genus, which for want of ſufficient ſpecimens could not at preſent be explored.

** *Ariſtatæ.*

6. EHRHARTA geniculata.

E. glumis coroll. exterioribus hirtis, altera mucronata; panicula coarctata; culmo decumbente geniculato.

Melica geniculata, corollis hirtis, panicula coarctata, culmo decumbente. *Thunb. prodr. p.* 21. *Spec. pl. ed. Wild. p.* 382.

DESCR. *Radices* longiſſimæ, filiformes, ſimplices.

Culmi 3—4-pedales, teretiuſculi, glabri, geniculati, inferne decumbentes, laxi.

Genicula tumida, fuſca.

Folia linearia, acuminata, plana, 4—6-uncialia, margine obtuſo cartilagineo leviter undulata, quaſi tenuiſſime crenulata, longitudinaliter ſtriata, glabra, ſupra glauceſcentia.

Vaginæ longitudine articulorum, tereti-compreſſiuſculæ, ſtriatæ, glabræ, arctæ, fauce nigricante ciliatæ; *ligula* albido-membranacea, lacero-ciliata.

Panicula erectiuſcula, coarctata, ſubramoſa, ſemipedalis, pedunculis ſubſecundis, pedicellis ſub floribus incraſſatis.

Flores oblongi, acuminati, erecti, exalbido purpuraſcentes.

Valvulæ calycinæ ovato-lanceolatæ, ſubacutæ, concavæ, muticæ, glaberrimæ, pallide purpuraſcentes; fere æquales.

Valvulæ

Valvulæ corollinæ exteriores calyce parum longiores, inæquales, carinatæ, albeſcentes, hirſutie erecta tectæ. *Exterior* linearis, acuminata; *interior* dimidio major, baſi exciſa, carina (oculo armato) ſerrato-ciliata, *mucrone* (ariſta brevi) ſubulato fuſco terminata.

Ad latera baſeos valv. inter. inſident duæ *ſquamulæ* ſubrotundæ oppoſitæ minutiſſimæ albidæ.

Valvulæ coroll. interiores muticæ, glabræ, carinatæ. *Exterior* lato-lanceolata, apice obtuſa, carina ciliata, flaveſcens, margine tenui diaphana. *Interior* dimidio minor lanceolata acuta tenera alba.

Nectarii petala oblonga, erecta.

Filamenta 6, breviſſima. *Antheræ* lineares, flavæ, pollen ex apice fundentes.

Germen ovatum, minutum. *Styli* 2. *Stigmata* alba, præcedentium.

This moſt reſembles the *E. calycina*; but, except a more geniculated diſpoſition of the culm, and the criſped edge of the leaves, as in the *E. mnematea*, the flowers appear to be longer. The calycine glumes equal in length with the corolla, which is more hairy than in the *E. calycina*. The exterior corolline glumes are alſo pointed, and one of them has a true, though ſhort, *ariſta*.

7. EHRHARTA longiflora.

E. glumis coroll. exterioribus rugoſis hiſpidis ariſtatis; panicula laxiuſcula ramoſa.

E. longiflora, culmo ſimplici, panicula ramoſa multiflora, corolla exteriori mucronata tuberculato-hiſpida, floribus triandris. *Smith ined. t.* 32.

E. ariſtata,

E. ariſtata, foliis planis, corolla rugoſa ariſtata. *Thunb. prodr. p.* 66.
E. Bankſii, floribus digynis, corollæ gluma exteriori exterius hiſpida. *Syſt. nat. ed. Gmel.* II. *p.* 549.

DESCR. *Radices* ſimplices, filiformes.

Culmus ſimplex, bi-tripedalis, erectus, baſi ſubgeniculatus, teres, glaber.

Articuli fuſci.

Folia lanceolata, latiuſcula, erecta, pedalia, glabra, ſtriata, margine plana, cartilagineo-ſcabra.

Vaginæ carinatæ, laxiuſculæ, ſtriatæ, fauce contractæ, imberbes, fuſcæ. *Ligula* intra faucem, margine laciniato-ciliata, fuſca.

Panicula palmaris, ſubramoſa, multiflora.

Pedunculi inæquales, capillares, conferti, ſubverticillati, *pedicellis* ſub floribus incraſſatis, hiſpidulis.

Flores majores, lanceolati, ariſtati, pallide l. viridi-purpuraſcentes, nitidi.

Valvulæ calycinæ inæquales, 5-nerves, muticæ, pallide purpuraſcentes. *Exterior* minor, ovata, acuminata, ſubcarinata, margine anteriore ſerrulata; *interior* duplo major, ovata, concava, apice ſerrulata, acumine brevi terminali.

Valvulæ corollinæ exteriores calyce longiores, ariſtatæ, pallide virides, fere pollicares, ſubæquales, lanceolatæ, compreſſo-priſmaticæ, complicatæ, carinatæ, apice convolutæ in *ariſtam* ſubulatam, rectam, longitudine valvulæ, hiſpido-ſcabram; inter angulos verſus baſin tranſverſe rugoſæ, ſubinde læves, dorſo l. præſertim verſus apicem hiſpidæ, oculo armato tuberculatæ. *Exterior* faſciculo pilorum ad baſin unico; *interior* baſi exciſa, cum duabus ſquamulis lateralibus albidis.

Valvulæ corollinæ interiores minores, ovato-lanceolatæ, acutæ, carinatæ, muticæ, nervoſæ, glaberrimæ; interiore parum minore anguſtiore teneriore; dorſo ſubbicarinata.

Nectarii petala minutiſſima, ovata, ſuperne latiora, lacero-ciliata, albida.

Filamenta ſex, brevia. *Antheræ* oblongo-lineares, utrinque fiſſæ, apice extrorſum pollen fundentes.

Germen oblongum. *Styli* duo. *Stigmata* congenerum, parva,

This is one of the larger kinds, with a geniculated culm, broad leaves, and a much branched panicle. The flowers are remarkable for their pointed exterior corolline glumes, and their long *ariſtæ*. The glumes are often tranſverſally wrinkled, but not ſo much as in the *E. mnematea*. One of the calycine glumes is uncommonly ſmall. The number of the ſtamina I have, in all the flowers I examined, found to be really ſix, although Dr. Smith has ſeen only three. Accordingly, I have been doubtful whether or not the plants of Smith and Thunberg ſhould be conſidered as different; but having good reaſon to believe that the unnamed ſpecimen of *E. longiflora* in the Linnæan herbarium was communicated originally by Thunberg, and alſo finding his *E. ariſtata* coinciding with the deſcription of Dr. Smith's *E. longiflora*, it is moſt likely they are not different ſpecies. The particular diſtinction appears to conſiſt in the length of the *ariſtæ* and of the glumes, in the ſaid deſcription ſtyled only *mucronatæ* *.

8. EHRHARTA gigantea.

E. glumis corollinis exterioribus hirſutis ariſtatis; panicula coarctata ſubverticillata; *culmo* arundinaceo, foliis involutis.

* They appear to be one and the ſame ſpecies. Nothing is more variable than the length of *ariſtæ* in graſſes. *J. E. Smith.*

Melica

Melica gigantea, corollis hirſutis ariſtatis, panicula verticillata; culmo erecto. *Thunb. prodr. p.* 21. *Sp. pl. ed. Wild. p.* 382.

Aira villoſa, foliis ſubulatis, panicula elongata anguſtata; floſculis ſeſquialteris hirtis ariſtatis; ariſta recta brevi. *Linn. ſuppl. p.* 109.

DESCR. *Radices* longæ, ſimplices, rigidæ, nudæ.

Culmus 6-pedalis, erectus, baſi ſublignoſus nodoſus, ad radices ſtolonifer, remote articulatus, teres.

Stolones cylindricæ radicantes craſſæ, vaginis imbricatis ſtriatis ſericeis tectæ.

Folia ſemipedalia, remota, linearia, apice ſubulato-involuta, integra, erecta, ſtriata, glabra, rigida, arundinacea.

Vaginæ arctæ, hirtæ s. pubeſcentes, fauce s. ad baſin foliorum margine reflexo nigræ.

Panicula bipedalis, erecta, coarctata, ſubramoſa, rachi apice ſubflexuoſa.

Pedunculi capillares, conferti, ſubverticillati l. ſecundi, nigricantes, glabri; plerique ſimplices breves, 3—4 lin. longi, erectiuſculi uniflori, uno alterove elongato 1—2-pollicari ſubdiviſo 3—4-floro laxo; *pedicellis* ſub flore incraſſatis.

Flores ſubnutantes, rubro-flaveſcentes.

Valvulæ calycinæ lanceolatæ, acutæ, concavæ, dorſo ſubcarinatæ, marginibus membranaceis oculo armato minute ciliatis, glaberrimæ, baſi purpuraſcentes; *exteriore* vix majore ſed latiore, apice minus acuto.

Corolla calyce duplo major, ariſtata.

Valvulæ exteriores lanceolatæ, concavæ, carinatæ, flaveſcentes, pilis longis albidis undique veſtitæ, baſeoſque faſciculatis; apice *ariſta* ſubulata, erecta, nigra, oculo armato ſerrata, valvulis dimidio breviore auctæ, margine membranaceo involutæ;

involutæ; ſubæquales l. *interiore* paullo majore, infima baſi exciſa.

Valvulæ interiores glabræ, muticæ. *Exterior* lato-lanceolata, retuſa, carinata, carina ſubciliata, breviſſime acuminata; *interior* minor, acuta, apice emarginata, tenera, alba, nitens.

Tuberculum minutiſſimum ad baſin inter valvulas interiores corollæ, ſeſſile.

Nectarii petala oblonga, baſi carnoſa lutea, ſuperne latiora, retuſa, margine crenulata, albida, radiato-venoſa.

Filamenta 6, filiformia, brevia. *Antheræ* lineares, flavæ, utrinque bifidæ, baſi obtuſæ, apice extrorſum polliniferæ.

Germen ovatum. *Styli* duo, lati, erecti, contigui. *Stigmata* longa, albida, cæt. conformia.

If the preceding deſerved the appellation of *longiflora*, this alſo merits the name of *gigantea*, being the largeſt known of its genus, and having the appearance of a reed. The flowers are in like manner proportionally large, and have, on minute inquiry, a ſtrict agreement with the generic character. They can by no means be united with the *Melicæ*, though the plant, as to the ramification and ſhape of the panicle, has ſome reſemblance to the *M. ciliata*. It cannot at all be compared with the *Airæ*, becauſe it has neither a *calyx biflorus* nor the habit of them. The interior corolline valves have probably been miſtaken for the ſuperfluous floret. The different colour and figure of the *ariſta* ſuggeſts the idea of ſuch a floret more than in the other ſpecies, notwithſtanding its ſhortneſs. The calycine glumes are ſtained with purple or brown, and are two-thirds the length of the corolla, which abounds with ſhining hairs.

9. EHRHARTA bulboſa.

E. glumis coroll. exterioribus obovatis emarginatis rugoſis ariſtatis; panicula ſimplici laxa.

E. bulboſa,

E. bulboſa, culmo indiviſo, panicula ramoſa multiflora, corolla exteriori retuſa ariſtata. *Smith ined. faſc.* 11.

Trochera ſtriata, culmo enodi, foliis glabris, pedicellis paniculæ plerumque unifloris, valvulis exterioris corollæ tranſverſim ſtriatis, baſi pappoſis ariſtatis. *L. Richard in Rozier Journ. de Phyſ. v.* 13. *p.* 225. *t.* 3.

DESCR. *Radix* . . . . . bulboſa.

Culmus erectus, pedalis & ultra.

Folia lanceolata, linearia, glabra.

Panicula erecta, laxiuſcula, ſimplex, 2—3-pollicaris. *Pedunculi* 3—5-ni, capillares, patentes, inferiores 2-flori longiores, ſuperiores ſenſim breviores, uniflori.

Flores pallide luteſcentes.

Valvulæ calycinæ ovatæ, acuminatæ, patentes, 2—6-lin. longitudine, membranaceæ; *interiore* parum majore.

Valvulæ corollinæ exteriores ſubæquales, s. interiore vix minore, calycis multo majores, complicatæ, carinatæ, obovatæ, baſi anguſtiores exciſæ, faſciculis albis villorum præditæ, apice latiores, obtuſæ, emarginatæ, *ariſtam* ſeſquilinearem erectam in emarginatura inſerentes, *rugis* tranſverſis elevatis notatæ, pubeſcentes.

Valvulæ interiores inæquales, compreſſæ, acuminatæ; *interiore* minore.

Nectarium ut in cæteris.

Filamenta tria ? ? *Antheræ* oblongo-lineares, apice bifidæ.

Germen oblongum. *Styli* 2, capillares. *Stigmata* villoſa.

This bears the ſame trivial name that Dr. Smith, probably on account of the root, has given it; I have, however, already proved that the root is not bulbous in this ſpecies only. The *E. mnematea* and

and *bulboſa* are neareſt related; they have both their exterior corolline glumes much wrinkled, but the latter is very diſtinct becauſe of its *ariſtæ*. The deſcription is a copy of Monſ. Richard's, made from a living ſpecimen out of a garden in France. He attributes to it only three ſtamina, which I will not diſpute, but ſhould wiſh for a further inquiry when the plant comes under future conſideration. The figure given by the author, though not good, gives an idea of the real ſpecific difference.

HAVING thus endeavoured to illuſtrate all the known *Ehrhartæ*, it may not be improper to add conciſe deſcriptions of the remaining two Cape *Melicæ* mentioned by Profeſſor Thunberg in his *Prodromus*, in order to ſhow that they are true ſpecies of *Melica*, and not to be referred to the above genus, leſt it ſhould be ſuppoſed there were no real *Melicæ* in that part of the world.

MELICA decumbens.

M. corollis hirſutis, floribus racemoſis nutantibus, culmo decumbente. *Thunb. prodr.* 21. *Sp. plant. ed. Wild. p.* 382—4.

DESCR. *Culmus* decumbens, teres, ſubfiliformis, glaber. *Genicula* glabra.

Folia conferta, baſi ſubimbricantia, erecta, lanceolato-linearia, apice involuto-ſubulata, glabra. *Vaginæ* ſtriatæ.

Flores racemoſi, ſecundi, pedicellati, ſemipollicares, nutantes in *racemo* terminali, erecto, bipollicari, indiviſo.

Calyx bivalvis.

Valvulæ ovatæ acuminatæ carinatæ, ſtriatæ, nervoſæ, glabræ, membranaceæ, flaveſcentes, baſi purpuraſcentes; exterior triplo minor.

Glumæ corollinæ bivalves, ſubæquales, extus, baſi imprimis, ſericeo-albidoque villoſæ.

Floſculus unus ſeſſilis, alter breviter pedicellatus.

Filamenta tria.

Rudimentum tertii floris, e. floſculus minutus, neuter.

MELICA racemoſa.

M. corollis hirtis, racemo ſubpaniculato floribus cernuis. *Thunb. prodr.* 21. *Sp. pl. ed. Wild. p.* 382—5.

DESCR. *Culmus* bipedalis erectus, teres, glaber, craſſitie *Melicæ altiſſimæ.*

Articuli glabri.

Folia linearia, erecta, apice involuta, glabra, ſtriata. *Vaginæ* ſtriatæ.

Racemus ſubpaniculatus, erectus, ſpithameus, ramis paucis brevibus.

Flores pedicellati, ſubſecundi, cernui, magnitudine *M. ciliatæ*, cui ſimillimi glumis calycinis & corollinis & numero ſtaminum.

EXPLA-

EXPLANATION OF THE FIGURES.

TAB. III. and IV. repreſent the flowers of all the foregoing ſpecies of *Ehrharta*.

a A flower of the natural ſize.

b A flower magnified.

c The calycine valves magnified.

d Both the corolline glumes, without the calycine valves, magnified, with the genitals within.

e The interior corolline valves, except in *E. mnematea*, where the exteriors alſo are repreſented.

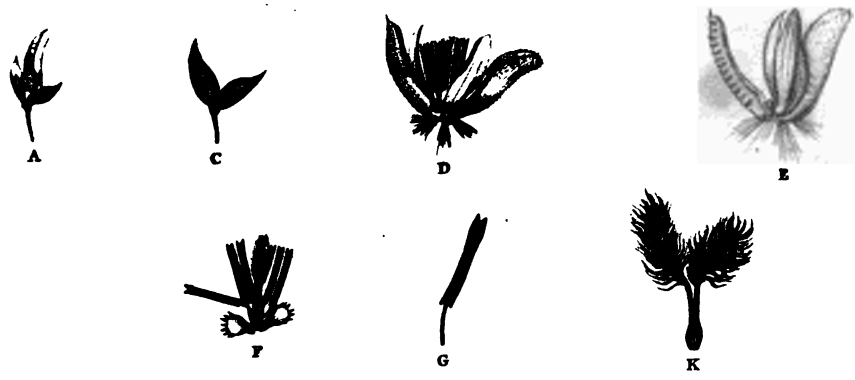
f k The male and female parts, or the female alone, together with the membranous nectary, all magnified.

g A filament with the *anthera* opening at the top, magnified.

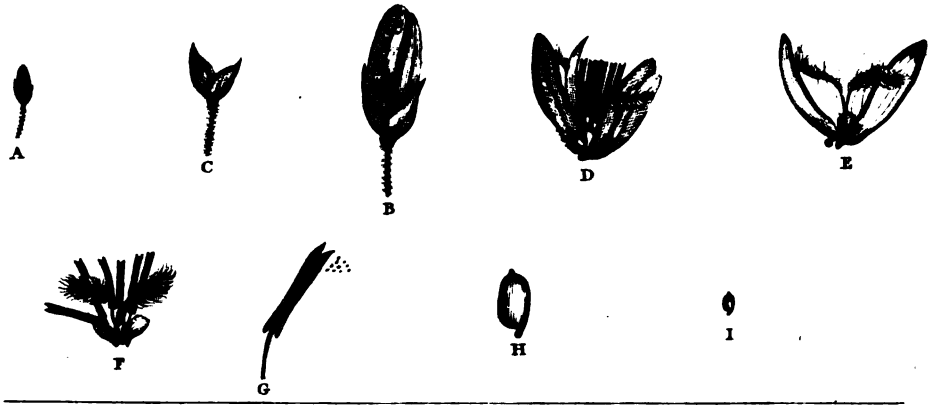
h The ſeed in *E. panicea* magnified.

i The ſame of its natural ſize.

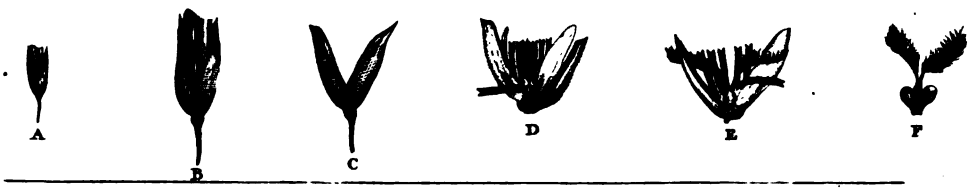
1 *Ehrharta mnematica* *Linn. trans. VI. Tab. III. p. 64.*



2 *E. panicea*



3 *E. ramosa*



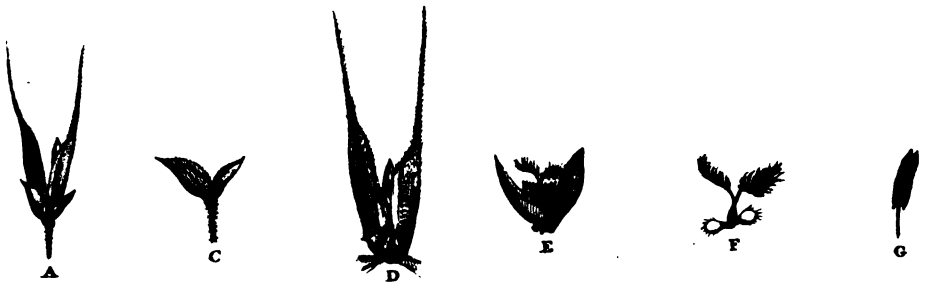
4 *E. melicoides*

G. Queiroz Sculp.

5 *E. calycina*

6 *E. geniculata*

7 *E. longiflora*



8 *E. gigantea*

9 *E. bulbosa*

G. Quiróz sculp.

III. *Account of a Microſcopical Inveſtigation of ſeveral Species of Pollen, with Remarks and Queſtions on the Structure and Uſe of that Part of Vegetables. By Luke Howard, Eſq. of Plaiſtow in Eſſex.*

Read March 4, 1800.

IN the Spring of 1795, having much leiſure, I devoted a portion of it to the examination of various minute productions of Nature in a good compound microſcope. Theſe reſearches would probably have terminated in preſent information and amuſement only, but that they were accidentally turned to the pollen of flowers, reſpecting which, as a botaniſt, I found an inclination to inform myſelf, by comparing the ſeveral ſpecies together.

I began my obſervations with the Hazel-tree, *Corylus Avellana*. On a calm dry day I ſhook off ſome of the pollen from the expanded catkins upon a clean piece of writing-paper. I alſo gathered ſome of the catkins and female buds. Theſe I viewed ſeparately on a clear plate of glaſs, uſually tranſmitting the light through them from a ſpeculum below, and with different magnifying powers, preferring thoſe which, without enormouſly enlarging the objects, gave a clear view of the ſtructure and poſition of ſeveral at once. As I purſued this method with the reſt I examined, I mention this to ſave repetition, and ſhall give the appearances from notes made at the time.

1. *Corylus Avellana.* Anthers furniſhed with tranſparent horn-like appendages. Pollen crumbles from the ſurface, and is ſometimes ſo abundant as to fall in a viſible cloud on the ſlighteſt motion

of a branch. To the naked eye it is a fine yellow powder. A few grains laid on the glaſs plate and viewed with the lens No. 4, ſome appear of an irregular angular ſhape, opake, except in one or two parts, where light paſſing preſents the appearance of a perforation; others nearly ſpherical, the ſurface divided by depreſſed lines into a number of convex facets. The tranſparency of theſe is ſuch, that they reflect the image of a ſmall object held under them, as well as a drop of liquid. On repeating the examination, the former are found to come from the moſt mature anthers, and to differ from the latter only as a raiſin does from a grape.

A clear drop of diſtilled water being put on the glaſs, both kinds imbibe it with the avidity of a ſponge; at the ſame time diſtending and ſpreading abroad in the water, but without any motion further than that which this expanſion cauſes. When ſaturated with water they remain at the bottom, clear as the liquid itſelf, and all alike diſtended to a bulk many times greater than their original one in the dry ſtate. They are now ſeen to be multilocular capſules, having ſepta in various directions within them, the union of which with the external membrane appears at the angles in the dry ſtate, and at the depreſſed lines in the wet.

Theſe capſules may be kept in the water for ſeveral days without any further perceptible change. When that is dried up they return to the opake ſtate, and the ſame operation may be ſeveral times repeated on them.

In exhibiting this ſpectacle to ſome friends, pure water not being juſt at hand, a drop of brandy was ſubſtituted for it. This gave riſe to a phænomenon equally curious and unexpected. The grains expand, as in water; but in the mean time they are put into rapid motion, each grain darting from ſide to ſide with the vivacity of a ſwarm of gnats in the air. As they approach to complete expanſion the motion dies away, and one after another ſinks to the bottom.

By

By a ſmall addition of freſh brandy ſome few are excited a ſecond time, but with fainter movements. Preſently the liquid begins to be obſcured, and in a few minutes the grains are moſtly diſperſed and decompoſed, and the ſpirit, exhaling, leaves a ſort of extract on the glaſs mixed with very minute undiſſolved particles; among which ſometimes appear a few unbroken grains, much changed, and now reſembling an empty bladder lying flat.

2. *Erica carnea.* Anthers capſular, bearing the pollen on their inner ſurface, and diſcharging it by a briſk exploſion from an aperture on the ſide next the piſtil. If the *ſtigma* be touched with a pin at a certain period of the inflorescence, it happens commonly that all the anthers project their pollen at once; and it may thus be collected on paper. The proper time for this is when the *ſtigma* is elevated a little from between the anthers. In ſize and ſtructure this pollen nearly reſembles the preceding, and is, in like manner, capable of imbibing water and diſperſing with a rapid motion in ſpirit.

3. *Reſeda odorata.* Mignonette.

Unripe pollen, ſmooth, egg-oblong, tranſparent, without ſepta? In water it expands to a ſphere, and is acted upon by ſpirit as the preceding.

4. *Cactus flagelliformis.* Creeping Cereus.

Anthers oblong, crumbling. Pollen of a large ſize, compared with any others I have ſeen; in ſhape reſembling a plump grain of wheat, white and diaphanous. It expands in water to a ſhape nearly ſpherical. The contact of ſpirit brings on a pearly opacity. The grains imbibe it ſlowly, and during expanſion revolve on their axes with a pretty regular motion, exhibiting a ſpectacle no leſs novel than delightful. In the mean time, ſome minute particles are ſeen to be ejected, and, the motion ceaſing, the tranſparency returns, proceeding from the ſurface to the centre.

If a piſtil be ſeparated from the expanded flower with grains of pollen adhering to it, the latter will be found already expanded to a ſpheroid. Cover the whole with a drop of ſpirit on the glaſs, the piſtil is not affected in any way, but ſome of the grains quit it and revolve on their axes. When theſe are exhauſted, the addition of more ſpirit excites others: after a few minutes, ſome of thoſe firſt excited begin to put out a ſmall thread, which gradually elongating, the grain diminiſhes in proportion, until it is entirely drawn out into a vermicular fibre, which again is preſently diſſipated into particles too minute to be ſeen in the now opake medium. The liquor from the tube of the piſtil, and a ſolution of ſugar in water, were alſo found to produce this evolution in very mature grains from the anther. It alſo ſometimes takes place in the twinkling of an eye, ſo as to be ſcarcely traced in ſome few grains out of a number put into ſpirit at once. Thoſe which have been ſome time in contact with the piſtil are always moſt ſluggiſh in their evolution.

5. *Carex acuta.*

Anthers oblong, crumbling. Pollen angular, opake, with apparent perforations. It dilates in ſpirit and remains ſtationary, but ejects numerous minute particles in rapid ſucceſſion from its ſurface. When it has become tranſparent it appears as if filled with ſeeds.

The preceding may ſerve for examples of theſe phænomena; but there was not one among the various ſpecies I examined, which did not exhibit them in a greater or leſs degree. Yet various other parts of the flower, immerſed in ſpirit under the microſcope, did not betray the ſmalleſt veſtige of them.

The proper ſpirit for this purpoſe ſeems to be a mixture of one part pure ſpirit of wine with two of water. A ſtronger ſpirit, or even ſpirit of wine alone, may ſometimes be required when we operate upon a pollen which has, by any means, become previouſly

ſaturated with moiſture, (or has loſt, by keeping, a part of its irritability?) but it does not enter the dry grains ſo readily as water alone.

I have ſince ſubjected pollen to examination in ſeveral of the moſt ſtimulant oily and ſaline liquids, but have not been able to perceive that any of them had a ſimilar effect on it.

It is proper here to remark that the utmoſt care is requiſite to prevent accidental mixtures of the ſubjects or menſtrua in theſe experiments, which might greatly embarraſs and miſlead the obſerver. Separate pieces of clear glaſs for the ſeveral kinds, and ſeparate pointed glaſs tubes to convey the liquids, will therefore be requiſite. It will be proper attentively to examine the pollen dry, as well as the liquids, before they are uſed, in order to be ſatisfied of the abſence of animalcules and other extraneous matters which might be ſuſpected to influence the appearances.

I do not pretend to ſay that the above-related experiments were abſolutely free from optical deception; but I may venture to affirm, from frequent repetition of them, that, when tried with due precaution, they will ſcarcely ever be found to fail of producing the appearances related.

Engagements of ſuperior importance at preſent prevent, and may long continue to prevent, my puſhing theſe inquiries much further. It is for this reaſon, and becauſe I ſhould take a pleaſure in ſeeing it done by ſome perſon more capable of executing them with due exactneſs, and drawing proper inferences from them, that I am willing to make them known in their preſent imperfect ſtate. For the aſſiſtance of thoſe who may incline to proſecute the ſubject, I ſhall now ſtate the amount of the preſent diſcovery, and the hints for further inveſtigation which have occurred to me.

Should it be found, on repeating and extending theſe obſervations,

tions, that the pollen of vegetables is in all caſes ſimilarly acted upon by water and by ſpirit of wine, it will follow,—

1. That each grain of pollen in the anther is an organic body, variouſly conſtructed in various ſpecies, and containing

a Veſſels or pores capable of imbibing water, of diſtending thereby and contracting again when it quits them; in which particulars they reſemble ſponge, &c.

b A parenchyma, conſiſting of ſome ſubſtance (of greater ſpecific gravity than water, and inſoluble therein), which is emitted with a greater or leſs degree of force when the ſtimulus of alcohol is applied to the abſorbent veſſels. This ſubſtance is either in part ſoluble in alcohol, or the grains contain

c An eſſential oil or reſin, to which they owe their colour and odour.

2. That there exiſts in the grains of pollen, in a very eminent degree, that property of vegetables called irritability, which they are capable of retaining for a certain time after ſeparation from the anther.

3. That alcohol is the proper ſtimulus by which this irritability may be excited, and the texture of the pollen in ſome manner developed in conſequence thereof. I prefer this method of accounting for the appearances that take place when the pollen is immerſed in ſpirit to another that might be ſuppoſed on chemical principles, being aſſured, that any one who has once inſpected the proceſs will be ſatisfied that ſomething more than mere ſolution or chemical decompoſition takes place therein, and that the vital principle of the pollen is the chief agent.

The liquor from the tube of the piſtil and the ſolution of ſugar were, indeed, found to bring on the evolution of the pollen of *Cactus flagel.* in a ſlower manner than ſpirit; but when we conſider how ſpeedily

ſpeedily ſuch matters paſs into the vinous ſtate, it ſeems poſſible that both of theſe might contain alcohol. Yet, it is alſo poſſible that ſomething common to this latter ſubſtance, with the ſaccharine matter it is producible from, may be the real exciting cauſe.

The exiſtence of abſorbent veſſels in the pollen is proved by the change of form, increaſed tranſparency, and great diſtention produced by the water. It is remarkable, that complete ſaturation uſually brings the grains near to a ſpherical ſhape, however remote from it their original one.

It ſeems neceſſary to ſuppoſe the parenchyma for the following reaſons. Something is evidently given out to the ſpirit before the diſperſion of the grain commences. In ſome caſes this is viſible in minute particles moving about in the drop; in others it is diſcoverable by the tinge on the dried ſpace, and by the ſtriæ which appear when more ſpirit is added. Now, if the grains conſiſted merely of the vegetable fibre formed into veſicles or cells, their texture would no more be deſtroyed by ſpirit than by water, and the penetration of the water would produce the ſame motions as that of the ſpirit. But if we ſuppoſe that, in proportion as the ſpirit penetrates the ſeveral parts of theſe curious capſules, ſome tranſparent ſubſtance is forcibly expelled from them; the various motions into which they are thrown will be eaſily explained by the recoil of the grain in the oppoſite direction. It will hence appear why the pollen of 1. which ſeems to conſiſt of many ſeparate cells, is driven alternately in all directions by their ſucceſſive diſcharge, and why that of 4. which is a long tube rolled up, and probably with but one orifice, is thrown into a rotatory motion. The opacity of this ſpecies during the diſcharge may be attributed to the evacuation of this canal, and the returning tranſparency to the entrance of the ſpirit into it from the abſorbent veſſels, or at the orifice. I do not remember to have

have ſeen a ſingle bubble of air eſcape from the grains of pollen in the whole courſe of my obſervations. As their texture was in many caſes quite deſtroyed, if it had been porous, as that of dry wood, &c. air muſt have appeared. I therefore conclude them perfectly ſolid in the dry ſtate.

I think it poſſible that the proſecution of theſe inquiries by means of the microſcope, may throw ſome light on the obſcure ſubject of vegetable reproduction; may teach us why the anther is almoſt always expoſed to the air for ſome time previous to the diſcharge of the pollen, and this even in aquatic plants; as alſo what is the office of that ſaccharine liquor with which the ſtigma is furniſhed, and of which ſuch a ſtore is ſometimes provided in the nectary. The very manner in which the impregnation takes place may poſſibly be learned by attentive obſervation.

The ſimilarity of the unfolded pollen of No. 4. to the form of the plant it comes from, might furniſh matter for ſpeculation; but I decline this, believing that experiment and careful obſervation muſt always precede ſound theory.

Reflecting on ſome of the properties of pollen in which it bears a reſemblance to ſtarch, I was led to examine that alſo in a ſimilar manner, and was not diſappointed to find its ſtructure the ſame. Starch conſiſts of homogeneous grains or capſules ſhaped like No. 3. capable of imbibing water with increaſe of bulk and tranſparency, and of returning to their original ſtate on parting with it. They are alſo diſperſed, with more or leſs of motion, in ſpirit; but in this particular different ſpecimens were found to vary, which may be attributed to difference in age or ſoundneſs. If a little wheat flour be mixed with water and ſpread on the glaſs, theſe grains appear in great abundance, mixed with fibrous matter. Other kinds of grain afforded the ſame reſult, with a difference in the form of

the

the capſules. As the vegetable fæculum, which conſiſts entirely of this kind of matter ſeparated from the ſoluble and fibrous part, has been long conſidered as the ſame ſubſtance, though obtainable from different parts of vegetables, I extended the inquiry to tuberous roots, and obtained a further confirmation of the identity of pollen and fæculum. A potatoe ſeems to be almoſt nothing elſe but an aſſemblage of grains of fæculum, with their interſtices occupied by the juice. If this root be boiled or baked until it becomes mealy, the juice will no longer be found; and we might be at a loſs to know what was become of it, if the microſcope did not ſhow that it has entered into the grains of fæculum, which are thereby greatly diſtended, as is, indeed, evident to the naked eye. The vital principle is thus deſtroyed; for theſe bloated grains will not move in ſpirits, but give out a tincture to it like other dead matter. By this means, and the loſs of ſolidity, they are prepared for more eaſy decompoſition in the ſtomach.

Starch is abſolutely inſoluble in water. If water containing it be made to boil, it becomes a jelly. I do not apprehend that a true ſolution takes place even in this caſe. It appears that the ſame effect is produced on the grains by the heat as by ſpirit of wine. They are diſperſed into very minute particles; and the ſurface being thus multiplied, a greater degree of attraction takes place between the ſtarch and the water, and the former remains ſuſpended.

It appears to me to be worthy of future inquiry,

1. In what parts of vegetables in general the pollen or fæculum is to be found.

2. In what reſpects that which is ſecreted on the anther differs from that which is contained in the root, ſeed, or ſap. In the leaf, petal, bulb, fibre of the root, or other parts already brought to perfection, I am inclined, from ſome obſervation, to think it will not be met with.

3. Whether the germ or embryo of the ſeed, previous to the impregnation, contains it.

4. In what manner the pollen of plants in general will be acted upon by the liquor from the nectary, when expoſed to it in circumſtances ſimilar to thoſe of Exp. 4.

5. And laſtly, to inveſtigate the varieties in form and ſtructure of the different ſpecies of pollen; and to examine how far they agree or differ in the ſeveral ſpecies of each genus, and genera of each natural order.

IV. *Obſerva-*

IV. *Obſervations on Aphides, chiefly intended to ſhow that they are the principal Cauſe of Blights in Plants, and the ſole Cauſe of the Honey-Dew. By the late Mr. William Curtis, F. L. S.*

Read May 6, 1800.

THE *Aphis*, or Blighter, as we now for the firſt time venture to call it, from its being the moſt general cauſe of what are termed blights in plants, forms a highly intereſting tribe of inſects. In point of number, the individuals of the ſeveral ſpecies compoſing it ſurpaſs thoſe of any other genus in this country *.

Theſe inſects live entirely on vegetables. The loftieſt tree is no leſs liable to their attacks than the moſt humble plant. They prefer the young ſhoots on account of their tenderneſs, and on this principle often inſinuate themſelves into the very heart of the plant, and do irreparable miſchief before they are diſcovered. But for the moſt part they beſet the foliage, and are always found on the under ſide of the leaf, which they prefer, not only on account of its being the moſt tender, but as it affords them protection from the weather, and various injuries to which they would otherwiſe be expoſed. Sometimes the root is the object of their choice, which, from the nature of theſe inſects, one would not *à priori* expect; yet have I ſeen the roots of lettuces thickly beſet by them, and the whole crop rendered ſickly and of little value: but ſuch inſtances are rare. They rarely

* Reaumur, conſidering each *Aphis* as bringing forth ninety young, calculates that in five generations the produce from a ſingle one would be five thouſand nine hundred and four million nine hundred thouſand.

alſo attach themſelves to the bark of trees, like the *Aphis ſalicis*, which being one of our very largeſt ſpecies, and hence poſſeſſing ſuperior ſtrength, is enabled to penetrate a ſubſtance harder than the leaves themſelves.

As among caterpillars we find ſome that are conſtantly and unalterably attached to one or more particular ſpecies of plants, and others that feed indiſcriminately on moſt ſorts of herbage; ſo it is preciſely with the *Aphides*: ſome of them are particular, others more general feeders.

As they reſemble other inſects in the above reſpect, ſo do they alſo in being infinitely more abundant ſome years than others; and though, with regard to certain inſects, this variation (ſometimes wonderful in the extreme, as in the brown-tail moth which ravaged the quickſet hedges in 1782) is not eaſily accounted for, it is ſolved without much difficulty as to the *Aphis*, as will be ſhown in the ſequel. In the year 1793 they were the chief, and in 1798 the ſole, cauſe of the failure of the crop of hops. In 1794, a ſeaſon almoſt unparalleled for drought, the hop was perfectly free from them, while peas and beans, eſpecially the former, ſuffered very much from their depredations. Beans were in 1798 almoſt wholly cut off by them; indeed they ſuffer more or leſs every year by a black ſpecies of *Aphis*, particularly the latter crops. To potatoes, and even to corn, we have known them ſome years prove highly detrimental, and no leſs ſo to melons. To plants in ſtoves, greenhouſes and frames, where, from the warmth and ſhelter afforded them, a preternatural multiplication takes place, they prove extremely injurious, and many a rare and valuable plant alſo in the open ground of our botanic gardens falls a victim to theſe general depredators. Seeing, therefore, that our neceſſaries as well as luxuries of life are ſo materially affected by the inſects of this genus, an attempt to aſcertain ſome of the curious and important facts

relative to their hiſtory, and to make them more generally known, will not, we truſt, be unacceptable to the public. Such inquiries may poſſibly lead to the means of obviating the injuries they occaſion; and if they fail in this, they may tend at leaſt to correct the erroneous notions entertained of blights, not by the vulgar and illiterate merely, but even by perſons of education, who may frequently be heard to maintain that theſe inſects are brought by the eaſt winds; that they attack none but ſickly plants; with other notions, all as falſe in fact as unphiloſophical in principle.

Locuſts and caterpillars, famed for their devaſtations, are furniſhed with ſtrong jaws, by means of which they crop and wholly devour the foliage of plants. The *Aphis* deſtroys them in a different way. Inſtead of jaws and teeth it is provided with a hollow-pointed proboſcis or trunk, which, when the animal is not feeding, folds under its breaſt. With this inſtrument it pierces the plant, and imbibes its juices to ſupport itſelf; but theſe juices being eſſential to the life of the plant, it follows that, when they are drawn off, the plant, exhauſted, flags and periſhes, being in fact literally bled to death by theſe leech-like animalcules. Yet, ſo tenacious of life are plants in a healthy ſtate, that they in general only fall victims to the continued attacks of theſe inſects when in immenſe numbers. But it moſt commonly happens that if they do not wholly deſtroy a plant they deface it, and a ſmall number of *Aphides* are ſufficient to produce this effect. The leaves of ſuch trees and plants as have a firm texture and ſtrong fibres, though infeſted with theſe inſects, preſerve their form; but the more tender foliage of others, and flowers in general, cannot bear their punctures without curling up and becoming diſtorted; in conſequence of which they loſe their beauty entirely and irretrievably. The cultivators of plants, eſpecially in ſtoves and green-houſes, cannot be too much on their guard againſt the whole tribe of *Aphides*; for with what pleaſure can a large

large or choice collection be viewed, when there is ſcarcely a plant but what exhibits ſymptoms of diſeaſe occaſioned by vermin?

As the ſpecies of this genus are very numerous, and afford but few marks of diſtinction, Linnæus has contented himſelf with giving moſt of them trivial names, according to the particular plant on which they are found: a cloſe attention to them will, however, diſcloſe more diſtinctive characters than naturaliſts are aware of.

Aphides are deſcribed by the beſt informed authors as being generally oviparous and viviparous at different periods of the ſame year. Mohſ. Bonnet, who had the honour of making this diſcovery in 1740*, ſays that in the ſummer the females are viviparous; but toward the middle of autumn they lay real eggs. De Geer obſerves, that the females of all the *Aphides* he had ſeen, conſtantly laid eggs, intended to preſerve the ſpecies during winter, and that he is therefore inclined to believe that the ſame takes place in all *Aphides* whatever. From the 24th of September to the 6th of December following, during which time Fahrenheit's thermometer had been as low as 29, I found the *Aphis ſalicis* to be conſtantly viviparous, though from the inclemency of the weather very few of theſe inſects at the period laſt mentioned remained on the trees, and thoſe few were ſoon after entirely cut off by the unuſual cold that took place, the thermometer falling to 4 degrees below 0.—Other *Aphides* are oviparous or viviparous according to the temperature of the air to which they are expoſed. In very cold weather they are oviparous, for this obvious reaſon; the eggs are capable of reſiſting cold more powerfully than the young. On the 22d of November ſame year as above, I found a conſiderable number of eggs which had been depoſited in ſome auricula plants by a ſmall green *Aphis*,

* Or rather Monſ. Trembley. See his Letter to M. Bonnet from the Hague: Oeuvres de Bonnet.

which

which infeſts plants very generally *, while the ſame *ſpecies*, on a geranium that I kept within doors, produced young. In mild winters I have obſerved, in the month of January, the ſame ſpecies of *Aphis* in great numbers on various ſpecies of primula without doors, and all the females viviparous. Theſe are facts which prove that all *Aphides* are not oviparous and viviparous at the ſame ſeaſon, but that ſome may be wholly viviparous; that all ſuch as are both oviparous and viviparous do not lay eggs toward the middle of autumn, nor at all during the winter, unleſs a certain degree of cold takes place.

Moſt people will think it a matter of very little moment to mankind whether an *Aphis* comes into the world with its head or its heels foremoſt:—it may be ſo; yet, as nature's hiſtorian, it is perhaps incumbent on us to notice this circumſtance. The young *Aphis* then is uſhered into the world with its feet foremoſt, ſee TAB. V. fig. I., and this act of parturition, unimportant as it may appear, ſerves to diſplay the wiſdom of the all-provident Author of Nature. The female *Aphis* is uſually delivered of its offspring as it ſits cloſe to the bark of the tree, but not ſuddenly and all at once. Two-thirds of the body of the young one is quickly protruded. When it gets ſo far, the power of expulſion ceaſes, and the delivery proceeds ſlowly. Time is thus given to the young one to learn the uſe of its legs, which it ſoon kicks about briſkly, and the firſt ſervice it employs them in is to clean away a white ſubſtance, the remains, perhaps, of the membrane in which it was enveloped in the womb.

* Theſe eggs were laid in ſmall, irregular groups, on the upper as well as on the under ſide of the leaves; they were of a perfectly black colour, and very viſible to the naked eye. I found afterwards that the eggs when recently excluded were green, from which colour they gradually changed to that which rendered them ſo conſpicuous. They were ſlightly attached to the leaf.

But

But what is of greater conſequence is, that it is enabled by their uſe to cling faſt to the bark of the tree as ſoon as it is brought forth, and thus to obtain its neceſſary nutriment.

Of ſome of the circumſtances attendant on the propagation of theſe minute animals accounts are related, deviating ſo wonderfully from the common courſe of nature, that they could not be credited, were not the authors of them known to be men of the niceſt and moſt accurate obſervation and of the ſtricteſt veracity. On this part of the ſubject I have little to ſay from my own obſervation; but, as ſome account of ſo extraordinary a part of their hiſtory may be expected in a paper of this ſort, I ſhall ſtate the facts, briefly obſerving that neither in the *Aphis ſalicis*, which at times I have watched with great attention, nor in any other ſpecies of *Aphis*, did I ever obſerve any ſexual intercourſe to take place. Whether this has ariſen from the extreme infrequency of ſuch a procedure, or from my not having obſerved theſe inſects at a proper time of the year, I know not; but, moſt undoubtedly, ſuch intercourſe does not take place between the different ſexes of *Aphis* as in other inſects. Yet Monſ. Bonnet, who may be ſaid to have almoſt taken up his abode with theſe inſects, informs us that he has frequently noticed ſuch connexion, which he deſcribes as taking place at one certain time of the year only; and that, from a female thus impregnated, many ſucceſſive generations will be produced without any further impregnation. He took the *Aphides* as ſoon as brought forth, and kept each individual ſeparate. The females of ſuch brought forth abundance of young. He took the young of theſe and treated them preciſely in the ſame manner. The produce was the ſame; and thus he proceeded to the ninth generation with the ſame ſucceſs: and ſo far from conſidering that as the utmoſt extent of the effect, he thinks it might be carried on to the thirtieth generation.

In

In moſt ſpecies of *Aphides* both males and females acquire wings at certain ſeaſons; but in this reſpect they are ſubject to great variation, there being ſome males and ſome females that never have wings; again, there are ſome females that become winged, while others of the ſame ſpecies do not.

In the quality of the excrement voided by theſe inſects there is ſomething wonderfully extraordinary. Were a perſon accidentally to take up a book in which it was gravely aſſerted that in ſome countries there were certain animals which voided liquid ſugar, he would ſoon lay it down, regarding it as a fabulous tale, calculated to impoſe on the credulity of the ignorant; and yet ſuch is literally the truth.

The ſuperior ſize of the *Aphis ſalicis* will enable the moſt common obſerver to ſatisfy himſelf on this head. On looking ſtedfaſtly for a few minutes at a group of theſe inſects while feeding on the bark of the willow, one perceives a few of them elevate their bodies, and a tranſparent ſubſtance evidently drop from them, which is immediately followed by a ſimilar motion and diſcharge like a ſmall ſhower from a great number of others. At firſt I was not aware that the ſubſtance thus dropping from theſe animals at ſuch ſtated intervals was their excrement, but was convinced of its being ſo afterwards; for, on a more accurate examination, I found it to proceed from the extremity of the abdomen, as is uſual in other inſects. On placing a piece of writing-paper under a maſs of theſe inſects, it ſoon became thickly ſpotted; holding it a longer time, the ſpots united from the addition of others, and the whole ſurface aſſumed a gloſſy appearance. I taſted this ſubſtance, and found it to be as ſweet as ſugar. I had the leſs heſitation in doing this, having obſerved that waſps, ants, flies, and inſects without number, devoured it as quickly as it was produced: but, were it not for theſe, it might no doubt be collected in conſiderable quantities, and, if ſubjected to the

proceſſes uſed with other ſaccharine juices, might be converted into the choiceſt ſugar or ſugar-candy. It is a fact alſo, which appears worthy of noticing here, that, though the waſps are ſo partial to this food, the bees appear totally to diſregard it.

In the height of ſummer, when the weather is hot and dry, and *Aphides* are moſt abundant, the foliage of trees and plants (more eſpecially in ſome years than others) is found covered with, and rendered gloſſy by, a ſweet clammy ſubſtance, known to perſons reſident in the country by the name of *honey-dew:* they regard it as a ſweet ſubſtance falling from the atmoſphere, as its name implies.

The ſweetneſs of this excrementitious ſubſtance, the gloſſy appearance it gave to the leaves it fell upon, and the ſwarms of inſects this matter attracted, firſt led me to imagine that the honey-dew of plants was no other than this ſecretion, which further obſervation has ſince fully confirmed. Others have conſidered it as an exudation proceeding from the plant itſelf. Of the former opinion we find the Rev. Gilbert White, one of the lateſt writers on natural hiſtory that has noticed this ſubject *.

But that it neither falls from the atmoſphere, nor iſſues from the plant itſelf, is eaſily demonſtrated. If it fell from the atmoſphere, it would cover every thing on which it fell indiſcriminately, whereas we never find it but on certain living plants and trees. We find it alſo on plants in ſtoves and green-houſes covered with glaſs. If it exuded from the plant, it would appear on all the leaves generally

* "June 4th, 1783. Vaſt honey-dews this week. The reaſon of theſe ſeems to be, that in hot days the effluvia of flowers are drawn up by a briſk evaporation, and then in the night fall down with the dews, with which they are entangled.

"This clammy ſubſtance is very grateful to bees, who gather it with great aſſiduity; but it is injurious to the trees on which it happens to fall, by ſtopping the pores of the leaves. The greateſt quantity falls in ſtill, cloſe weather; becauſe winds diſperſe it, and copious dews dilute it, and prevent its ill effects. It falls moſtly in hazy, warm weather." *See White's Naturaliſt's Calendar, p.* 144.

and

and uniformly; whereas its appearance is extremely irregular, not alike on any two leaves of the ſame tree or plant, ſome having none of it, and others being covered with it but partially.

But the phænomena of the honey-dew, with all their variations, are eaſily accounted for by conſidering the *Aphides* as the authors of it. That they are capable of producing an appearance exactly ſimilar to that of the honey-dew, has already been ſhown. As far as my obſervation has extended, there never exiſts any honey-dew but where there are *Aphides*; ſuch, however, often paſs unnoticed, being hid on the under ſide of the leaf. Wherever honey-dew is obſervable about a leaf, *Aphides* will be found on the under ſide of the leaf or leaves immediately above it, and under no other circumſtances whatever. If by accident any thing ſhould intervene between the *Aphides* and the leaf next beneath them, there will be no honey-dew on that leaf. Thus then we flatter ourſelves to have incontrovertibly proved that *Aphides* are the true and only ſource of the honey-dew.

We have found that where the ſaccharine ſubſtance has dropped from *Aphides* for a length of time, as from the *Aphis ſalicis* in particular, it gives to the ſurface of the bark, foliage, or whatever it has dropped on, that ſooty kind of appearance which ariſes from the exploſion of gun-powder, which greatly diſfigures the foliage, &c. of plants. It looks like, and is ſometimes miſtaken for, a kind of black mildew. We have ſome grounds for believing that a ſaccharine ſubſtance, ſimilar to that of the *Aphis*, drops from the *Coccus* alſo, and is finally converted into the ſame kind of powder.

In moſt ſeaſons the natural enemies of the *Aphides* are ſufficient to keep them in check, and to prevent them from doing any eſſential injury to plants in the open air. But ſeaſons ſometimes occur, very irregularly indeed, on an average, perhaps, once in four or ſix years, in which they are multiplied to ſuch an exceſs, that the

uſual means of diminution fail in preventing them from doing irreparable injury to certain crops.

In ſevere winters we have no doubt but *Aphides* are very conſiderably diminiſhed; in very mild winters we know they are very conſiderably increaſed; for they not only exiſt during ſuch ſeaſons, but continue to multiply. Their enemies, on the contrary, exiſt, but do not multiply, at leaſt in the open air, during ſuch periods; and thus the *Aphis* gets the ſtart of them, and acquires an aſcendency, which once acquired is not eaſily overcome by artificial means, upon a large ſcale at leaſt, in the open air. Vain would be the attempt to clear a hop-garden of theſe pernicious vermin, or to reſcue any extenſive crop from their baneful effects. Violent rains attended with lightning have been ſuppoſed to be very effectual in clearing plants of them; but in ſuch caſe more is to be attributed to the plants being refreſhed and made to grow by the rain, of which they ſtood in need, than to any deſtruction of the *Aphides* themſelves, which, on an accurate examination, will be found to be as plentiful after ſuch rains as they were before; nor is wet ſo injurious to theſe inſects as many imagine, as is evident from the following experiment: On the 12th of May 1799, I immerſed in a glaſs of water the footſtalk of a leaf of conſiderable length, taken from a ſtove plant, beſet with *Aphides* of a dark lead colour, which were feeding on it in great numbers. On immerſion they did not quit the ſtalk, but immediately their bodies aſſumed a kind of luminous appearance from the minute bubbles of air which iſſued from them. They were put under water at a quarter paſt ſix in the evening, and taken out at a quarter paſt ten the next morning, having continued immerſed ſixteen hours. On placing them in the ſun-ſhine, ſome of them almoſt immediately ſhowed ſigns of life, and three out of four at leaſt ſurvived the immerſion. One of the ſurvivors, a male, very ſoon became winged, and another, a female,

was

was delivered of a young one. Many years before this experiment, with a view to deſtroy the *Aphides* which infeſted a plant in my green-houſe, I immerſed one evening the whole plant, together with the pot in which it grew, in a tub of water. In the morning I took out the plant, expecting with certainty to find every *Aphis* dead; but to my great ſurpriſe they ſoon appeared alive and well: and thus, in addition to the other extraordinary phænomena attendant on theſe inſects, we find that they are capable of reſiſting the effects of immerſion in water for a great length of time. When taken from the plant on which they feed, and kept under water, they do not ſurvive ſo long; their ſtruggling in that caſe perhaps exhauſts them ſooner. This part of the ſubject might be puſhed much further: it is ſufficient for our purpoſe to have ſhown that wet is not ſo hurtful to them as is generally imagined.

Though no mode of deſtroying *Aphides* will perhaps ever be deviſed on a large ſcale in the open air by artificial means, we can accompliſh it moſt effectually when they infeſt plants in ſtoves, green-houſes, and frames, or in any ſituation in which we can envelop them for a certain time in clouds of ſmoke. Powders or liquids, however fatal to *Aphides*, muſt ever be ineffectual, from the trouble and difficulty of applying them ſo that they ſhall come in contact with thoſe inſects, ſituated as they uſually are; but in this reſpect ſmoke has every advantage, it penetrates and pervades their inmoſt receſſes. The ſmoke of common vegetables, however powerful, is found to be inadequate to their deſtruction, and hitherto no other than that of tobacco is found to be effectual. That, judiciouſly applied, completely anſwers the purpoſe, without injuring the plant. It moſtly happens in well managed houſes that a few plants only are infeſted with *Aphides*: in ſuch a caſe, the ſmoking of the whole houſe is a buſineſs of unneceſſary expenſe and trouble; and we would recommend to perſons who have large collections to make uſe

of a box of a commodious form that ſhall hold about a dozen plants of various ſizes, to be uſed as a ſort of hoſpital, in which infeſted plants may be ſmoked ſeparately, and the inſects more effectually deſtroyed, becauſe it may be rendered more perfectly ſmoke-tight.

To prevent the calamities which would infallibly reſult from the accumulated multiplication of the more prolific animals, it has been ordained by the Author of Nature, that ſuch ſhould be diminiſhed by ſerving as food for others. On this principle, we find that moſt animals in this predicament have one or more natural enemies. The helpleſs *Aphis*, the ſcourge of the vegetable kingdom, has to contend with many. The principal are the *Coccinella*, the *Ichneumon Aphidum*, and the *Muſca aphidivora*. Such as are unacquainted with the hiſtory of inſects will learn with ſome ſurpriſe that the *Coccinella**, a common inſect well known even to children by the name of the Lady-bird, is one of the greateſt deſtroyers of the *Aphides*, which indeed are its only food, its ſole ſupport, as well in its perfect as in its *larva* or grub ſtate. During the ſeverity of winter this inſect ſecures itſelf under the bark of trees, or elſewhere†. When the warmth of ſpring has expanded the foliage of plants, the female depoſits its eggs on them in great numbers, from whence in a ſhort time proceeds the *larva*, a ſmall grub of a dark lead colour ſpotted with orange: theſe may be obſerved in the ſummer ſeaſon running pretty briſkly over all kinds of plants; and if narrowly watched, they will be found to devour the *Aphides* wherever they find them. The ſame may be obſerved of the Lady-bird in its perfect ſtate. As theſe inſects in both their ſtates are

* All the different ſpecies of *Coccinella* feed on *Aphides*; the *bipunctata*, by far the moſt common, does the moſt execution.

† Many are found in houſes; for, early in May 1799, I counted on the window of my common ſitting-room, expoſed to the ſun, nineteen of the *Coccinella bipunctata*.

very

very numerous, they contribute wonderfully to diminiſh the number of *Aphides*. There is a ſaying which humanity has put into the mouths of children in favour of this inſect *, now rendered more ſacred by its great utility, which has happily rendered it a ſort of favourite with them, and contributes uſually to its eſcape from their dangerous clutches. Another moſt formidable enemy to the *Aphis* is a very minute, black and ſlender Ichneumon fly, the *Ichneumon Aphidum* of Linnæus. The manner in which this inſect proves ſo deſtructive to the *Aphis* is different from that of the Lady-bird. The female Ichneumon, of which numbers may be found where *Aphides* are in plenty, ſettles on a ſtalk, or leaf, more or leſs covered with them, marches ſlowly over their bodies, feeling with its *antennæ* as it proceeds for one of a ſuitable ſize and age; which having diſcovered, it puſhes forward its body, or abdomen, in an incurved ſtate, and with a fine inſtrument at its extremity, inviſible to the naked eye, punctures, and depoſits an egg in, the body of the *Aphis*; which having done, it proceeds, and lays an egg in a ſimilar way in the bodies of many others. The egg thus depoſited quickly hatches, and becomes a ſmall *larva*, or maggot, which feeds on the ſubſtance of the *Aphis*, and, having eaten the whole of it, the ſkin excepted, it changes to a *pupa*, or chryſalis; in which ſtate when it has remained a ſufficient time, it becomes an Ichneumon fly, which eats its way out of the *Aphis*, leaving the dry inflated ſkin of the inſect adhering to the leaf, like a ſmall pearl. Such may always be found where *Aphides* are in plenty. We have obſerved different ſpecies of *Aphides* to be infeſted with different Ichneumons.

In general the torpid *Aphis* ſubmits quietly to this fatal operation; but we have obſerved ſome of them, eſpecially one that feeds on the

* "Lady-bird, lady-bird, fly away home! Your houſe is on fire, your children at home."

ſycamore,

ſycamore, which is much more agile than many of this race, endeavour to avoid the Ichneumon with great addreſs.

There is, perhaps, no genus of inſects which in their *larva* or maggot ſtate feed on ſuch a variety of food as the *Muſca*, or Fly. There is ſcarcely a part of nature, either animate or inanimate, in which they are not to be met with. One diviſion of them, called by Linnæus *Muſcæ aphidivoræ*, feeds entirely on *Aphides*. Of the different ſpecies of aphidivorous flies, which are numerous, having moſtly bodies variegated with tranſverſe ſtripes, their females may be ſeen hovering over plants infeſted with *Aphides*, among which they depoſit their eggs, on the ſurface of the leaf. The *larvæ*, or maggot, produced from ſuch eggs feeds, as ſoon as hatched, on the younger kinds of *Aphis*; and, as it increaſes in ſize, attacks and devours thoſe which are larger. Theſe *larvæ* are uſually of a pale colour, adhere cloſely to the leaf, along which they ſlowly glide, and are formed very tapering towards the head. When fully grown, they change to a *pupa*, or *chryſalis*, attached to the leaf, from whence iſſues the fly. The *larvæ* of theſe flies contribute their full ſhare to diminiſh the deſpoilers of Flora. To theſe three kinds of inſects, which are the chief agents in the hands of Nature for keeping the *Aphides* within their proper limits, we may add a few others which act a ſubordinate part in this neceſſary buſineſs of deſtruction.

The *larva* of the *Hemerobius* feeds on them in the ſame manner as that of the *Muſca aphidivora*, and depoſits its eggs alſo on the leaves of ſuch plants as are beſet with *Aphides*. The eggs of this *Hemerobius* ſtand on long filaments, which are attached by a baſe to the leaf, and have more the appearance of the filaments of flowers with their *antheræ* than the eggs of an animal. The number of theſe

theſe inſects being comparatively very ſmall, they may be conſidered rather as the caſual invaders of their exiſtence than the main hoſt of their deſtroyers.

The Earwig, which is in itſelf no contemptible enemy to plants, makes ſome atonement for its depredations by deſtroying the *Aphides*; eſpecially ſuch as reſide in the curled-up leaves of fruit-trees, and the purſes formed by certain *Aphides* on the poplars and other trees.

Laſtly, we may add as the enemies of theſe creatures, ſome of the ſmaller ſoft-billed birds, which feed generally on inſects, and which may frequently be ſeen buſily employed in picking them from the plants. Their utility did not eſcape the obſervation of the pleaſing author of the Seaſons. We ſhall quote the whole of what he writes on this ſubject, preſuming that none of our readers will think it too long; remarking, however, that he has fallen into the error of moſt others in regard to the manner in which theſe inſects are ſaid to be brought by the eaſterly winds, and that he confounded the miſchiefs of Caterpillars with thoſe of the *Aphis*.

" For oft engender'd by the hazy north,
Myriads on myriads, inſect armies warp
Keen in the poiſon'd breeze, and waſteful eat
Thro' buds and bark into the blacken'd core
Their eager way. A feeble race! yet oft
The ſacred ſons of vengeance, on whoſe courſe
Corroſive famine waits, and kills the year.
To check this plague, the ſkilful farmer chaff,
And blazing ſtraw, before his orchard burns,
Till, all involv'd in ſmoke, the latent foe
From every cranny ſuffocated falls;
Or ſcatters o'er the blooms the pungent duſt
Of pepper, fatal to the froſty tribe;
Or, when the envenom'd leaf begins to curl,
With ſprinkled water drowns them in their neſt;
Nor, while they pick them up with buſy bill,
The little trooping birds unwiſely ſcares.

When plants aſſume a ſickly appearance, or are disfigured by diſeaſe, from whatever cauſe the diſeaſe may ariſe, they are ſaid to be blighted. Blights originate from a variety of cauſes, the chief of which are unfavourable weather and inſects.

Two opinions prevail very generally in regard to blights: the one, that the inſects which are the cauſe of them are brought from a diſtance by eaſterly winds; the other, that they attach themſelves to none but plants already ſickly. Neither of theſe opinions, as far as I have obſerved, is founded in fact. I am induced, from the numerous obſervations I have made on inſects for a ſeries of years, (in purſuing the cultivation of plants) to conſider the *Aphis* as by far the moſt general cauſe of the diſeaſes diſtinguiſhed by the name of blights. Other inſects, it is true, more eſpecially the *larvæ* of ſome of the *Lepidoptera*, as thoſe of the *Phalænæ tortrices*, disfigure and do infinite miſchief to plants, by rolling and curling up the leaves. But theſe for the moſt part confine themſelves to certain trees and plants. Their ravages alſo are of ſhorter duration, being confined to the growth of one brood, and they are alſo leſs fatal. It would be no difficult matter for me to fill a volume with obſervations, to which I have been an eye witneſs, of the injuries which plants ſuſtain from inſects; but that would be foreign to my preſent purpoſe, which is to ſhow that the *Aphis* is the grand cauſe of theſe diſeaſes, and to place the *modus operandi*, or the manner in which they effect this buſineſs, in its true light.

We are fully aware that certain gregarious inſects may at particular times riſe up in the air, and, if ſmall and light, be impelled by any wind that may chance to blow at the time; and on this principle we account for that ſhower of *Aphides* deſcribed by Mr. White to have fallen at Selborn. But certainly this is not the mode in which thoſe inſects are uſually diſperſed over a country. The phænomenon is too unuſual, the diſtribution would be too partial; for

Aphides,

Aphides, while at their higheſt point of multiplication, do not ſwarm like bees or ants, and fly off or emigrate in large bodies; but each male or female *Aphis*, at ſuch periods as they arrive at maturity, marches or flies off without waiting for any other. Yet it may happen that, from a tree or plant thickly beſet with them, numbers may fly off or emigrate together, being arrived at maturity at the ſame moment of time.

Detaching itſelf from the plant, each purſues a different route, intent on the great buſineſs of multiplying its ſpecies; and ſettles on ſuch plants in the vicinity as are calculated to afford nouriſhment to its young.

The common green *Aphis*, which is ſo generally deſtructive, lives during the winter ſeaſon on ſuch herbaceous plants as it remained on during the autumn, either in its egg or perfect ſtate. If the weather be mild, it multiplies greatly on ſuch herbage; as the ſpring advances, in May the males and females of theſe inſects acquire wings: and thus the buſineſs of increaſe, hitherto confined, is widely and rapidly extended, as the winged *Aphides*, by hop-planters called the Fly, may be ſeen from this period very generally ſitting on plants, and floating in the air in all directions.

Minutes of Appearances obſerved in the Aphis ſalicis *from the End of September to December 6th.*

The *Aphis ſalicis* is among the largeſt Engliſh ſpecies, and is found on the bark both of the trunk and branches of the *Salix triandra*, *fragilis*, and *viminalis*, but moſt abundantly on the laſt. The bodies of theſe inſects contain a red liquid, and hence perſons employed in ſtripping oſiers have their hands rendered apparently bloody by unavoidably bruiſing them.

Near the end of September multitudes of the full grown inſects of this ſpecies, both winged and others, are obſerved to deſert the

willows on which they feed, and to ramble ſolitarily over every neighbouring object, in ſuch numbers that we can handle nothing in their vicinity without cruſhing ſome of them. Are they retreating to freſh trees, on which to depoſit their young, or ſeeking ſome warmer ſituation for the winter ſeaſon? Vaſt numbers of them, moſtly in a younger ſtate, ſtill remain in large maſſes on the trees.

Though numberleſs inſects, Waſps in particular, were devouring the ſweets they depoſited, the Lady-bird *(Coccinella)* was the only one which preyed on the *Aphides* themſelves; and theſe towards the end of the month began to relax their depredations, and to retreat to their winter quarters.

As the ſeaſon advances, the *Aphides* are found higher on the trees, proceeding gradually upwards in queſt of new food. When the young *Aphis* is brought forth, and is completely diſengaged, it inſinuates itſelf under the body of its mother, and places itſelf cloſe to its elder brother or ſiſter, thus early manifeſting an attachment to that congregated ſtate of ſociety in which it afterwards exiſts.

If by ſtriking it you jar the branch of the tree on which *Aphides* are placed, or ſhould a waſp or other large inſect approach them ſuddenly, or rudely, the whole of them as it were in a maſs elevate their bodies and hind legs and put them in motion; and herein appear to conſiſt their whole powers of defence; in this ſtate their very fine white legs, thus elevated, give them a curious filamentous appearance. We have frequently obſerved white incruſtations adhering to different parts of their legs, wings, and bodies.

Oct. 12. Still obſervable in great maſſes on the large branches of the trees.

Many winged males now among them, yet no appearance of copulation. Many pregnant females emigrating from the maſs.

Nov. 8. A fine warm day, after many of violent and long continued rain, the *Aphides* were obſerved to be very much diminiſhed in

in number. On ſome of the branches they had quite diſappeared, but on others great numbers ſtill remained in maſſes. Diſeaſe was now making havock among them; the bodies of many were ſwollen and diſcoloured. Moſt of them were ſuſpended by the *proboſcis*, ſtill inſerted into the bark of the tree; their juices were of a deep purple or blackiſh hue. Not a Waſp to be ſeen, but few Flies, and fewer *Coccinellæ*, the only natural enemy to which we have obſerved this ſpecies to be ſubject.

Nov. 10. On opening the abdomen of one of the largeſt females, I counted ſixty-one young, large and ſmall.

Put by in three ſeparate pill-boxes, placed in a warm cloſet to the ſouth-weſt, many large pregnant apterous *Aphides*, and many males with their wings perfectly expanded, and others with their wings not expanded.

The large apterous *Aphides* depoſited young in the boxes, but all of them died in leſs than a fortnight. Theſe ſeveral *Aphides* were placed in this ſituation to ſee if they would live through the winter, as they would be out of the reach of froſt.

Nov. 21. Opened the body of a female *Aphis*, and found it to contain forty-ſix young; three parts of theſe at leaſt were ſuch, and the ſmalleſt of them had more the appearance of embryos than eggs.

At the cloſe of the month of May 1799, after a very long and hard winter, plants were more free from *Aphides* than uſual; yet, in ſheltered gardens particularly, I found them on the top ſhoots of trees, (none on herbaceous plants) as the currant, gooſeberry, apple, cherry, and common ſpindle tree. As yet, few of them had wings. It would appear from this circumſtance, that the female muſt lay her eggs in hard winters on the extremities of the branches.

Obſerved the excrement of a black *Aphis* clear and tranſparent, but the liquor from the tubular *Cornicula* was of a purple colour.

It appears that the excrementitious ſubſtance both of this black *Aphis* and the common green one cryſtallizes ſoon after it is evacuated at this ſeaſon of the year; for we obſerve a white ſubſtance on the leaves where the *Aphides* are, and ſcarcely any of the gloſſy honey-dew.

At twenty minutes paſt ſix in the evening of May 31ſt, I immerſed ſome black *Aphides* in water, with the leaves of the *Evonymus europæus* on which they were feeding, in two ſeparate glaſſes of water, and took them out at ten. All ſurvived the experiment.

At twelve at noon I immerſed ſome common green *Aphides* on gooſeberry ſhoots, and a black ſort on *Evonymus*, in water; when taken out at twelve at noon next day they were found every one dead.

TAB. V. fig. 1. repreſents part of a branch of the *Salix viminalis* with a number of ſpecimens of the *Aphis ſalicis.*

——————fig. 2. is a female of the ſame ſpecies magnified, in the act of excluding its young.

V. *Remarks*

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V. *Remarks on the Genera of Pæderota, Wulfenia, and Hemimeris.* By *James Edward Smith, M.D. F.R.S. P.L.S.*

Read October 7, 1800.

THE genus of *Pæderota* was firſt conſtituted by Linnæus in his Academical Diſſertation entitled *Plantæ rariores Africanæ*, publiſhed at Upſal in 1760, and reprinted in the 6th volume of the *Amœnitates Academicæ* in 1763. In the former edition the genus was called *Hemimeris*, in the latter *Pæderota*, and the only ſpecies there mentioned bears the trivial name of *bonæ ſpei*. This plant has never been well known to botaniſts in general. The original ſpecimen probably remained in Profeſſor Burmann's hands, along with the other plants deſcribed in the above-mentioned diſſertation; but Linnæus, I know not at what period, obtained another, which is preſerved in his herbarium with the name of *b. ſpei* in his own hand, and which he afterwards deſcribed in the *Supplementum* as *Hemimeris diffuſa*. Unfortunately he neglected to quote *Pæderota bonæ ſpei* as a ſynonym in that work, and his ſon, with all the materials before him, totally overlooked it; ſo that Profeſſor Murray, and other compilers, give us the ſame plant under both names. Even M. De Juſſieu ſeems not to have known this original ſpecies of *Pæderota*. His ideas of the genus are taken from the *Buonarotta* of Micheli, and the *Pæderota lutea* of Scopoli, the former of which is referred to *Pæderota* by Linnæus in the 2d edition of *Sp. Plant.* by the name of *P. Buonarota*, and the latter is called in his 2d *Mantiſſa*, *P. Ageria*. Theſe plants appear again in the *Supplementum*, with new and improved ſpecific characters, under the names of *P. cærulea* and *P. lutea*, and their

old.

old denominations not being there quoted, each of them occurs twice in Murray's and Gmelin's editions of the *Syſtema*; but ſuch repetitions are too frequent in both thoſe writers to excite our wonder at preſent. M. De Juſſieu obſerves, very juſtly in my opinion, that the *Wulfenia* of Jacquin agrees in genus with theſe laſt-mentioned plants. This being the caſe, and as they by no means agree with the original *Pæderota*, it would be beſt to range them under that of *Wulfenia*, a name which has every poſſible claim to be retained. *Pæderota* may very well be ſpared. The plant which firſt bore that name was *previouſly* called *Hemimeris*, as I have already obſerved, and is now ſo denominated in the *Supplementum*, along with two others that accord with it in genus. If the name *Wulfenia* ſhould be refuſed to the plants to which I would apply it, they muſt be called *Buonarotta*, merely on account of priority; for I know of no other claim to ſuch an honour in the Florentine ſenator after whom Micheli named them.

The generic characters of *Wulfenia* and *Hemimeris* may be expreſſed as follows:

WULFENIA.

Diandria Monogynia, next to Veronica.

Corolla tubuloſa, ringens. *Calyx* quinquepartitus. *Capſula* biloculari, quadrivalvis.

The ſpecies are,

1. *W. Buonarotta*, caule folioſo, corollæ labio ſuperiore indiviſo.
2. *W. Ageria*, caule folioſo, corollæ labio ſuperiore emarginato.
3. *W. carinthiaca*, caule nudo, foliis crenatis.

HEMIMERIS.

Didynamia Angioſpermia, next to Antirrhinum.

Calyx quinquepartitus. *Corolla* rotata, reſupinata, baſi gibboſa, hinc fiſſa. *Filamenta* glabra. *Capſula* bilocularis.

The

The only ſpecies I have hitherto aſcertained are the following:

1. *H. fabuloſa* diandra, foliis oppoſitis pinnatifidis, caule proſtrato.
2. *H. diffuſa*, didynama, foliis alternis oppoſitiſque pinnatifidis, caule patulo.
3. *H. montana*, diandra, foliis ovatis ſerratis obtuſiuſculis, caule erecto.
4. *H. urticifolia*, didynama, foliis ovatis ſerratis acutis, caule ſuffruticoſo, capſulis retuſis.
   Celſia urticifolia. *Curt. Mag. t.* 417.
5. *H. linearis*, didynama, foliis lineari-lanceolatis ſubſerratis, caule ſuffruticoſo, capſulis acutis.
   Celſia linearis. *Jacq. Ic. rar. v.* 3. *t.* 497. *Curt. Mag. t.* 210.

The three firſt I know only from ſpecimens in the Linnæan herbarium. The *diffuſa* is ſuſpected by the younger Linnæus to be a variety of the *fabuloſa*, to which I can ſcarcely aſſent. It is not eaſy to ſay which of the two may be the original *Pæderota bonæ ſpei*. The ſpecimen of Linnæus ſo marked is the *diffuſa*; but he had not that before him when he wrote the diſſertation upon rare African plants, and it has certainly four ſtamina. If the number of ſtamina be conſtant, the *fabuloſa* (which has but two) muſt have been the real *Pæderota*. The *montana* is ſufficiently diſtinct in habit and character from both.

The two remaining ſpecies are natives of Peru, and have for ſome time been commonly known in our gardens as ſpecies of *Celſia*, but certainly without foundation. The error originated with Profeſſor Ortega, and he has been followed by Jacquin and Curtis againſt their own judgment, for neither of theſe plants has the habit or character of any *Celſia*. It is to be lamented that ſuch erroneous names ſhould be ignorantly given and heedleſsly retained, as it is difficult to eradicate them when once applied to any very popular and ornamental plant. Thus a moſt beautiful *Chelone* has been

lately brought from Spain by the ſpecific name of *ruelloides*, and it is ſo called amongſt us: but a more prepoſterous blunder was hardly ever made in botany, as thoſe who know the plant, and can read Linnæus's *Supplementum*, *p.* 279, will readily perceive. With reſpect to the two ſpecies of *Hemimeris* in queſtion, they perfectly accord with the generic character given above, with which alſo the Linnæan *ſabuloſa* and *diffuſa*, (which I have carefully macerated and diſſected), and to all appearance the *montana* alſo, perfectly agree. In their general habit and ſtructure they alſo manifeſtly form altogether one natural genus.

VI. *An Illuſtration of the Genus Solandra. By Richard Anthony Saliſbury, Eſq. F. R. S. and L. S.*

Read November 4, 1800.

CUM in variis amabilis Botanices Scientiæ partibus, id mihi conſtanter propoſitum fuit, ut rariores ſtirpes in horto, ſi quando fructum maturaverint, eas demum accurate intelligerem, forſan non dedignetur Societas Linnæana obſervationibus quibuſdam quæ *Solandram* illuſtrent: genus longe pulcherrimum æque ac diſtinctiſſimum. " Attamen Angli hanc recepere teſte horto Kew," in *Linn. Præl. p.* 392. obſervat Giſeke. Lamarck, in *Journ. Hiſt. Nat. v.* 1. *p.* 369. aſſerit, " que ce pretendu genre eſt une veritable eſpece de Datura." Utinam ſane more parco auctoris Horti Kewenſis nova genera reciperent alii Botanici, quippe qui ingenii acumine venerando ſuo præceptori Linné parum cedens, nè unicum genus, ſecundum noſtrum tantillum judicium, in eo libro inſeruit, quod non ſummo jure diſtingui debet. Fatendum eſt autem neque characterem hujuſce generis in *Vetenſk. Acad. Handl. ann.* 1787. *p.* 301. primo propoſitum, neque alterum ab eodem auctore in ſuâ *Fl. Occ. Ind. v.* 1. *p.* 386. nuperrime publici juris factum, omnino attigiſſe felicitatem, quâ noſtris temporibus plures novæ ſtirpes dignoſcuntur. Fructu certe gaudet Daturæ. Folia vero conſtanter alterna, nec per paria in ramis florentibus approximata, inflorescentia, corolla irregularis cum æſtivatione limbi, hæc omnia a veris *Solaneis* adeo late recedunt, ut multo potius in proprio Ordine, cum conſimilibus ſtirpibus Brunſfelſiâ, et Creſcentiâ, locarem. Affinitatem cum Beſleria video nullam.

SOLANDRA.

Torus medioliformis. *Calyx* margine tori inſertus, tubuloſus, perſiſtens. *Corolla* margine tori inſerta: limbo ventricoſo, irregulari, ſubæſtivatione imbricato; deciduo. *Filamenta* 5, ore tubi inſerta, verſus latus inferius ſecunda. *Pericarpium* ſuperum, pene totum 4-loculare, ſucculentum, deciduum. *Semina* receptaculo longe ſtipitato, centrali, profunde 2-lobo, undique ſeſſilia.

Solandra grandiflora. *Swartz Fl. Ind. Occ. v.* 1. *p.* 386. *t.* 9. Solandra grandiflora. *Mæn. Exot. Bot. t.* 6. Solandra grandiflora. *Swartz in Vetenſk. Acad. Handl. ann.* 1787. *p.* 300. *t.* 11. Stramonium ſcandens, flore luteo. *Plum. Ic ined.* Peach-coloured trumpet flower, *Jamaicenſibus.*

Sponte naſcentem in Inſ. *Jamaica*, in truncos arborum ſæpe paraſiticam fiſſuriſque rupium, legit O. Swartz.

Floret *Januario, Februario*, fructum maturans *Auguſto.*

Frutex 9—20 pedes altus. *Radix* fuſca, longe excurrens, ramoſiſſima, ſpongioſe lignoſa. *Caulis* cinereus, ſcandens, teres: Rami multi, varie flexi, alii longiſſimi: plus minus radicans, rimoſus; ſuperne pallide viridis, viſcido-pubeſcens; ſpongioſe lignoſus. *Folia* denſa, alterna, frondoſa: Petioli viridi-purpuraſcentes, recurvuli, ſemiteretes, viſcido-pubeſcentes, ſupra concavi lineâ medio eminente: Laminæ ſupra virides, ſubtus pallidiores, petiolis multo longiores, recurvo-patentiſſimæ, obovato-lanceolatæ, integerrimæ, acuminatæ, utrinque viſcido-pubeſcentes, paululum lucidæ, planiuſculæ, carnoſæ: Nervi plures, medius craſſior petioloque confluens: quotannis prodeuntia et decidua. *Flores* fragrantes, nutantes, ſolitarii, rarius 2 vel 3 faſciculati. *Pedunculi* pallide virides, ramulis terminales, craſſi, 4-5 lineas longi, obconici, inſertione articulati, minutiſſime viſcido-pubeſcentes. *Torus* pallide viridis, pedunculo confluens quo brevior et craſſior, medioliformis, obſolete angulatus,

minutissime viscido-pubescens. *Calyx* pallide viridi-purpurascens, margine tori insertus, 3 pollices longus vel plus, erectus, tubulosus, 5-angulus lateribus concaviusculis, sub floreſcentiâ per angulos duos vel tres breviter & inæqualiter fissus, postea fructu intumescente sæpe profundius usque ad basin; laciniæ erectæ, semilanceolatæ, integerrimæ, accumulatæ: minute viscidulo-pubescens potissimum intus, extus nonnihil lucidus, persistens. *Corolla* margine tori inserta, 7-8-pollices longa; Tubus pallide viridi-flavus, calyce parum brevior, versus latus ejus inferius declinatus, inferne vix 3 lineas diametro, superne sensim dilatatus, 5-gonus, ad insertionem filamentorum extus depressiusculus: Limbus maximâ parte albidus, tubo multo longior; inferne infundibuliformis; mox admodum ventricosus fauce circiter 2 pollices diametro; dein recurvus ore summo $4\frac{1}{2}$ pollices diametro, breviter 5-fidus; per indivisam partem obsolete 10-angulus, angulis 5 ab inferioribus tubi continuatis intusque Vittâ obscure purpureâ coloratis, 5 ab insertione filamentorum enatis multo tenuioribus intusque Vittâ obsoletissimâ vel nullâ: Laciniæ extus læte purpurascentulæ interstitiis basi minute suborbicularibus, exquisitissime ciliatæ; 1 extima, semiorbicularis, repandula, plana; 3 interiores majores latere altero quod æstivatione includitur dilatato incisocrenato crispoque; 1 intima, maxima, semiorbicularis, tota elegantissime crispo-crenulata: inferne extus glabra, cæterum lævis, coriacea, decidua. *Filamenta* 5, pallidissime viridi-flava basibus obscure purpureis, ore tubi inserta, decurrentia, limbo circiter dimidio breviora, deorsum secunda, incurva, approximata, subulata, glabra. *Antheræ* pallidissime viridi-flavæ lateribus purpureis, basi insertæ ibidemque breviter 2-fidæ, filamentis longe breviores, erectæ, nonnihil lunulatæ, 4-angulæ, mucronulatæ, 2-loculares: Valvæ 4, 2 anteriores paulo angustiores et rectiores: lateraliter dehiscentes; post anthesin obscure purpureæ, paulo minores, inæquilateraliter

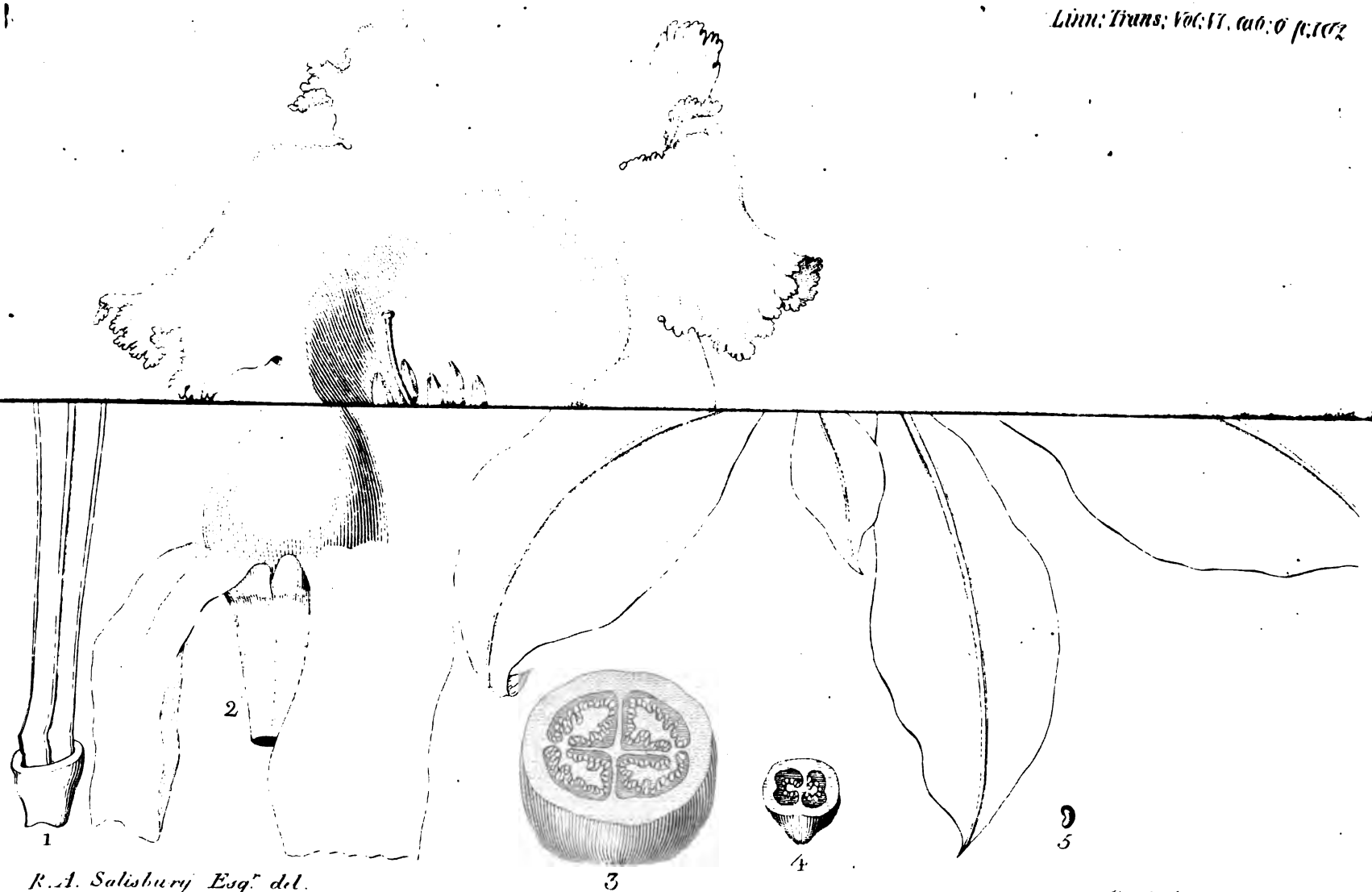
quilateraliter ovatæ, valde compreſſæ. *Pollen* pallidiſſime flavum. *Pericarpium*: caſtum pallidiſſime viridi-flavum, diſco tori ſuperum, pyramidale, læve: gravidum 1½-2 pollices longum, ovatum, fere uſque ad apicem 4-loculare, dein ſeptis 2 parietalibus ſenſim deficientibus 2-loculare; receptacula 2, centralia, longe ſtipitata, profunde 2-loba, varie repando-ſinuoſa: parturiens ſucculentum, deciduum, putreſcens. *Stylus* apice purpuraſcentulus, directione filamentorum quibus tenuior et altior, teres, glaber. *Stigma* pallide viride, compreſſum, minutiſſime pubeſcens, tenuiter canaliculatum. *Semina* plurima, ferruginea, receptaculo undique ſeſſilia, reniformia, 2-cotyledonea.

Conſiſtentiam fructus in uno eodemque genere, admodum variare tot docent exempla, ut vix unquam iſtâ ſolâ notâ plantam abludentem ab affinibus ſepararem: ſtructuram ejus contra, in diverſiſſimis generibus ſimillimam eſſe, multæ aliæ ſtirpes Claſſis 8-væ *Juſſ. Gen.* præter hanc de quâ ſupra agitur, probant.

EXPLICATIO TAB. VI.

Fig. 1. Corollæ tubus cum inſertione genitalium.
2. Pericarpium ſubmaturum.
3. Idem juxta medium tranſverſe ſectum, ubi 4-loculare.
4. Idem juxta apicem ubi 2-loculare.
5. Semen maturum.

VII. *Obſerva-*



R.A. Salisbury Esq.r del.

Quiréz sculp.

VII. *Obſervations on ſome remarkable Strata of Flint in a Chalk-pit in the Iſle of Wight, in a Letter from Sir Henry Charles Engleſield, Bart. F.R.S. to John Latham, M.D. F.R.S. and L.S.*

Read April 1, 1800.

DEAR SIR,

AS you conſidered the ſpecimens of flint which I ſhowed you worthy of the notice of the Linnean Society, I tranſmit them to you, together with ſuch an account of the ſituation in which I found them, as may perhaps lead to a gueſs of the cauſes of their preſent very extraordinary condition, and will at leaſt ſerve as a guide to thoſe who may wiſh at a future time to inſpect the curious pit where I found them.

Before I enter on the particular deſcription of that ſpot I cannot help ſaying a few words on the lithology of the iſland in general, which has not, that I know of, been deſcribed, as it highly deſerves, by any naturaliſt. Had I been equal to ſuch a taſk opportunities of obſervation were wanting, and the phænomenon which I am about to deſcribe was diſcovered by me ſo ſhort a time before I quitted the iſland that I had not time to inſpect more than one pit beſides that in which I firſt obſerved it.

The Iſle of Wight, which is nearly of a rhomboidal form, lies with reſpect to its four angles, almoſt abſolutely in the foun points of the compaſs. It is divided into two very nearly equal parts by a range of chalk hills, whoſe general direction is due eaſt and weſt. Theſe hills do not, however, lie in a ſtraight line, nor are they at all

of equal breadth or height throughout their extent. At F[illegible] bridge, where they form the eaſtern point of the iſland, they riſe abruptly from the ſea to a height of about 400 feet; and, bending a little to the northward, they continue of nearly the ſame elevation and a very narrow breadth, till they terminate at the valley through which the Medina runs. To the weſt of the Medina the range grows conſiderably wider, and is ſubdivided into ſeveral ſubordinate vallies. This additional breadth gives the ſouthern limit a great curvature to the ſouth, while the northern line remains nearly ſtraight. Their elevation increaſes much, and at Mottiſton is 700 feet. The acute and perpendicular promontory in which they terminate to the weſt, well known by the name of the needles, is nearly as high as Mottiſton. Beſides the valley of the Medina this range is ſingularly interrupted by two vallies exactly ſimilar to each other at the two ends of the iſland. Brading Haven renders Yaverland at the eaſt almoſt an iſle, and the Yarmouth inlet cuts off the weſtern end ſo nearly that at high tides it is ſometimes quite inſulated at Freſhwater Gate.

To the north of this range of chalk hills the ſoil is chiefly clay, with a ſuperſtratum, in many parts, of gravel. The clay is interſperſed with many beds of ſtone of different qualities, and which appear to lie in great confuſion. Of theſe ſome are grit with a ſlight admixture of calcareous matter; others have nearly equal parts of ſand and lime, and others are purely calcareous. In the firſt, which are of great hardneſs, very few extraneous bodies appear. In the ſecond are many fine impreſſions of ſhells, while the laſt are almoſt entirely compoſed of moulds of turbinated ſhells ſo as to appear quite honeycombed by them. This ſtone is, however, of great durability, for the walls of Cowes Caſtle, which was built by Henry VIII. and is expoſed to the ſea air from the weſt and north, are as perfect as on the day in which they were built. Below all theſe

ſtrata

ſtrata of ſtone, at Eaſt Cowes, and juſt above a bed of black and ſolid clay, is a ſtratum of ſhells about two feet thick, of which a ſpecimen accompanies this, and which is totally compoſed of theſe ſhells without any admixture or earth whatever. As the ſea makes great inroads here, vaſt heaps of theſe ſhells lie on the beach, and ſeem juſt waſhed up by the waves, inſtead of being torn from their bed in the cliff. They appear nearly in the ſame ſtate as thoſe on the Hampſhire coaſt, which have long been famous among naturaliſts. In the bed at Eaſt Cowes there appears however no variety; for I could ſee no ſpecies but what are here exhibited.

Whatever confuſion in the ſtrata appears to the north of the chalk range, or in that range itſelf, diſappears to the ſouth of it, where the ſtrata are nearly in a horizontal poſition, and ſingularly regular and undiſturbed. The ſea coaſt from Bembridge ſouth to the Needles, except in the ſmall extent of Sandown Marſh, is every where higher than the immediately contiguous land of the iſland, and to the ſouth-eaſt riſes into a vaſt range of hills running from Dunnoſe weſt to St. Catherine's. The ſubſtratum of theſe hills ſeems every where to be clay lying in ſtrata of different colour and purity. The loweſt is black and very hard; approaching to ſhale. Above this ſome ſtrata have a great mixture of ſand, and take the appearance of a ſoft ſtone breaking into very regular cubical forms. Theſe ſtrata extend over the whole ſouthern part of the iſland, and terminate againſt the chalk range very ſuddenly. Above the clay ſtrata is a bed of ſtone in thin layers, and of very mingled materials, but in general very hard. Great quantities of chert or flint nodules appear in this ſtone. The general thickneſs of the ſtratum is from 150 to 200 feet. Above this the higheſt hills of the range have a ſtratum of chalk, not pure or white as that of the chalk range properly ſo called, nor producing flint ſo black.

The height of Dunnoſe is 800 feet above low water mark. St. Catherine's hill is at leaſt 850. Of the former I had no opportunity of examining accurately the thickneſs of the ſtrata; but at St. Catherine's the ſtrata are as follow:

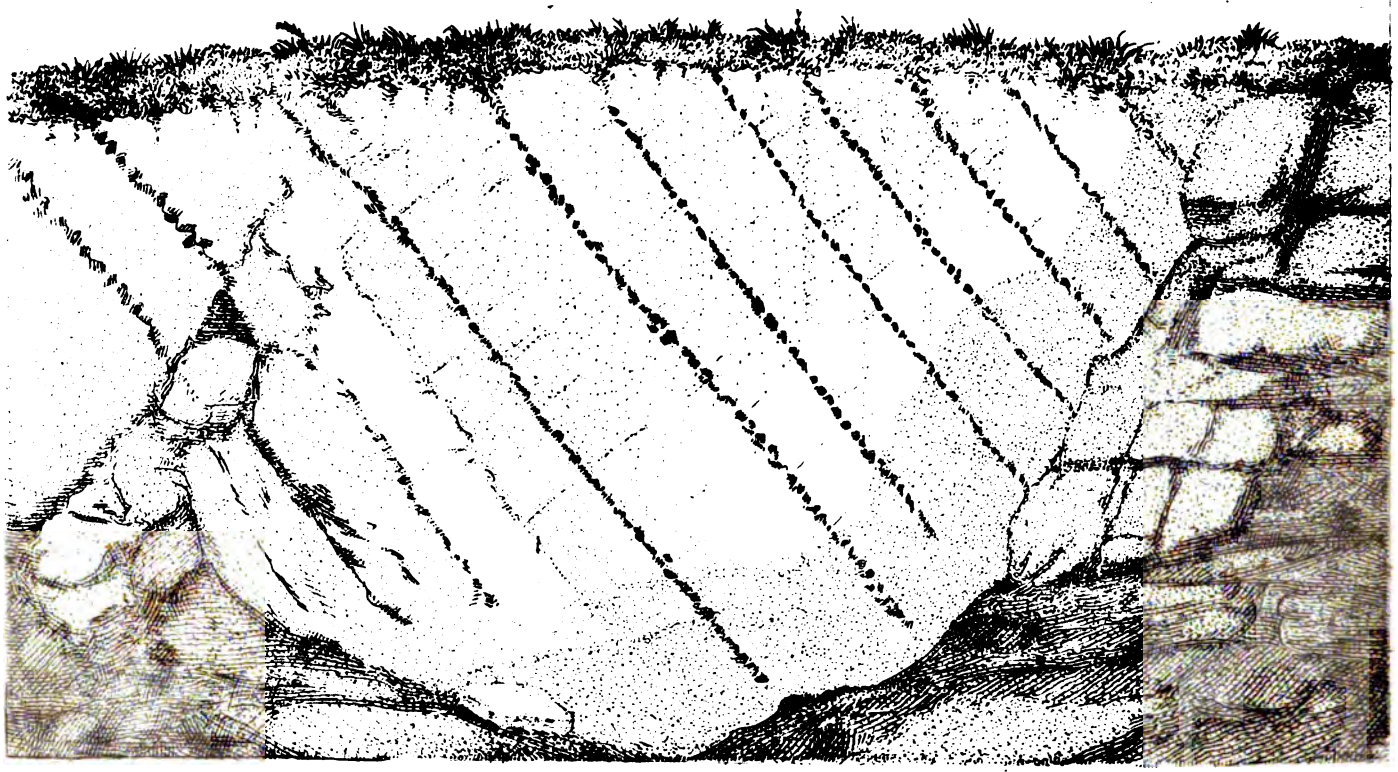
Chalk	-	250 feet
Stone	-	200 feet or perhaps not quite ſo much.
Clay and ſand		400 feet
		850

This arrangement accounts entirely for the formation of that ſingular coaſt called the Undercliff, which extends from Dunnoſe to St. Catherine's, and is compoſed of the confuſed fragments of the upper ſtratum of rock which have given way and rolled down as the ſubſtratum of clay has been waſhed away by the ſea. In moſt parts the proceſs ſeems nearly at a ſtand; the coaſt being now protected by the fallen rocks; but at St. Catherine's great devaſtation is ſtill taking place. The earth-fall mentioned laſt year was a very ſmall operation of this kind when compared with the relicks of former convulſions.

From this ſhort ſketch of the general poſition of the ſtrata in the iſland, I return to the particular ſubject of the preſent paper.

The chalk pit, which I am about to deſcribe, is ſituated on the northern edge of the chalk range juſt out of the village of Cariſbrook, and about an hundred yards beyond the diviſion of the roads to Yarmouth and Shorwell. The pit is open to the eaſt. The ſtrata of chalk are very regular, from two to five feet in thickneſs, and divided by ſeams of flint from ſix inches to nine inches in depth. The flints are, as uſual, in nodules of different ſizes, from the ſize of the fiſt to twice the ſize of a man's head. The whole dip northward with an inclination of at leaſt 67 degrees. Perpendicular fiſſures run through the whole from north to ſouth, the ſides of which

Livius. Transact. VI. Heft 7. p. 107.



which are nearly as flat and ſmooth as a wall. As theſe fiſſures are followed with convenience in working the pit, an extenſive face was laid open when I ſaw it, and the appearance was as in the annexed ſketch. See TAB. VII. On examining the beds of flint nearly, I was aſtoniſhed to find that every flint, though lying in its place, and retaining perfectly its original ſhape, was more or leſs burſt and ſhattered; ſome few were only ſplit into large pieces, but the greater part were broken into ſmall fragments, and ſome abſolutely reduced to impalpable powder. From one which had ſuffered the moſt the annexed ſpecimen was taken. The powder was ſo very fine that I had conceived it muſt have been mixed with chalk; but, on waſhing it with diluted marine acid, I found that it was purely ſiliceous. Indeed the chalk which ſurrounds theſe flints is uncommonly ſolid, and does not exhibit cracks or marks of any violence except the great fiſſures beforementioned. A ſpecimen of the flint powder after waſhing in the acid is ſent with the other.

I muſt obſerve that I had but imperfect opportunity of inſpecting the flints which lay at a diſtance from the fiſſure; ſuch however as I could ſee in the bed then working appeared to have been leſs ſhattered in proportion as they were more remote from the fiſſure; but all had ſuffered more or leſs.

About 200 yards below this pit, and nearer to Cariſbrook village, the road is in part cut through the chalk, and the beds of flint expoſed by that means exhibit the ſame appearances as thoſe in the pit above.

The chalk pit above Shide Bridge, which is the only one I had an opportunity of examining after my diſcovery of the phænomenon above deſcribed, preſents in ſome degree the ſame appearances, but does not afford ſo good an opportunity of viewing the ſtrata as that at Cariſbrook. The ſtrata did not appear to me to lie ſo regularly

nor the flints to be diſpoſed ſo much in beds as at Cariſbrook. They were however extremely broken and ſhattered, and apparently the moſt ſo where they lay moſt in ſtrata. The ſtrata had alſo a great inclination or dip to the north.

Although it would be raſh to attempt to account for this very ſingular ſtate of deſtruction of the flints in the Cariſbrook pit, yet it is impoſſible not to offer ſome conjectures on the ſubject. There can be very little doubt that the ſtrata, though now ſo inclined, were originally formed in a horizontal poſition. When the tremendous convulſion took place which ſunk them to the ſituation in which they now appear (at which time the channel which ſeparates the Iſle of Wight from the main land was perhaps formed), the ſtrata of chalk, in the act of ſubſidence, had a tendency to ſlide on each other, and this would be exerted moſt ſenſibly where from the admixture of the flints the coheſion of the parts of the chalk was the weakeſt. This motion, or rather ſtrain, of ſo enormous a weight, might in an inſtant ſhiver the flints, though their reſiſtance ſtopped the incipient motion; for the flints, though cruſhed to powder, are not diſplaced, which muſt have been the caſe had the beds ſlid ſenſibly. This conjecture is perhaps ſtrengthened by what I obſerved in a few detached nodules of flint in the chalk ſtrata which did not appear to have ſuffered as thoſe in the beds of flint have done. I may here add that it ſeemed as if in ſome places the fine powder of the flints had run down, and inveſted the nearer parts of the fiſſure with a thin coating of the agglutinated duſt; but this may poſſibly have taken place ſince the face of the fiſſure has been expoſed to the weather.

Perhaps it may not be totally foreign from the preſent ſubject, to mention that in a very great chalk pit at the village of Preſton, a mile north of Brighthelmſtone, in which the flints lie in very regular and nearly horizontal ſtrata, but which has alſo vaſt perpendicular

fiſſures in the chalk, the fiſſures are in many places filled to a conſiderable extent with a very thin vein of pure flint exactly as if the flint, not being quite hard when the fiſſures took place, had been ſqueezed out of the beds and run into the fiſſures as ſoft pitch would do. I do not mean at all to ſay that this was the caſe, but merely to deſcribe the appearances. In the chalk pit juſt below the church at Brighthelmſtome another ſingular appearance may be ſeen. The upper part of the chalk is in ſeparate maſſes, not properly rubble, but with all their tender angles ſharp exactly as if juſt broken to pieces to put into the lime kiln, and quite clean, nearly of a ſize, and almoſt without any chalk powder mixed with them.

I remain, &c.

Southampton, Jan. 22, 1800.

VIII.

VIII. *Remarks on ſome Britiſh Species of Salix. By James Edward Smith, M.D. F.R.S. P.L.S.*

Read May 5, 1801.

IT has for a long time been my intention to offer to the conſideration of the Linnean Society ſome elucidation of the Britiſh Willows; but there are many reaſons why any thing like a complete hiory of of the genus of *Salix* cannot at preſent be made out, even ſo far as regards our native ſpecies, and I have therefore withheld the partial information I had acquired, in hopes of learning more, and being able to communicate ſomething better worth the Society's acceptance.

At length however it becomes neceſſary that this obſcure genus ſhould aſſume as regular a form as poſſible in the *Flora Britannica*; where, as in every other inſtance, my object is to publiſh nothing that I have not aſcertained myſelf, at leaſt as far as the imperfection of all human knowledge and judgment will permit. The enumeration therefore of the ſpecies of *Salix* in that book, though more comprehenſive than any yet publiſhed in Britain, will be but an eſſay, to be perfected hereafter; and what I have to offer in this paper are various matters collected in the courſe of my inquiries, which require a more diffuſe explanation than the ſyſtematic form of the work juſt mentioned will admit. I ſhall at preſent confine my obſervations to the arboreſcent ſpecies of the firſt ſection of the genus *Salix*, which comprehends ſuch as have leaves more or leſs ſerrated, and nearly ſmooth, at leaſt when fully formed. This is the moſt

moſt difficult ſection, and I flatter myſelf I ſhall be able to furniſh ſome new information reſpecting it.

Some difficulties which attend the inveſtigation of this genus are almoſt peculiar to it. Willows to be well underſtood require to be ſtudied at three different periods of their growth; firſt when in flower, at which time the leaves in general ſcarcely appear at all; next when the capſules are fully formed and nearly ripe, and the leaves juſt expanded, with their ſtipulæ; laſtly when the leaves have attained their full ſize, and all remains of the fructification have diſappeared. In this laſt ſtate the true form, and pubeſcence or ſmoothneſs, of the leaves is to be known; in the ſecond the nature of the *ſtipulæ*, which frequently are very deciduous, and the figure and ſurface of the capſules; whereas in the firſt ſtate the very diſcriminative and curious parts of the flower, the ſtamina, nectaria, and, above all, the proportion and ſtructure of the germen, ſtyle and ſtigmata, are only to be learnt. I have found the laſt-mentioned parts ſo conſtant and important, ſo ſtrongly indicative of natural ſubdiviſions of the genus, that if we could at all times command them, they would certainly afford better characters for that purpoſe than the margin or pubeſcence of the leaves. But the dioecious nature of theſe plants is another inconvenience, and peculiarly militates againſt a general arrangement of them according to parts, which it is an even chance whether we meet with or not, and which are moreover ſo very tranſient.

If I ſhould prove more ſucceſsful in treating the ſubject under conſideration than my predeceſſors Mr. Hudſon and Mr. Lightfoot, it will be greatly owing to three cauſes. Firſt the publication of Profeſſor Hoffman's *Hiſtoria Salicum*, ſo full, ſo accurate, I might almoſt ſay ſo perfect, as far as it goes. This work the authors of the *Flora Anglica* and *Flora Scotica* never knew. In the next place the opportunity I have had of ſtudying the Linnæan original ſpecimens,

in

in this genus peculiarly ample and inſtructive, and of comparing them, through Her Majeſty's gracious permiſſion, with Mr. Lightfoot's Herbarium, by which moſt of the doubtful ſpecimens mentioned in his *Flora*, p. 611, have been referred to ſome ſpecies or other, and all his difficulties with regard to others removed. Laſtly the aſſiſtance I have received from my accurate and indefatigable friend Mr. Crowe, who for many years has with unwearied diligence collected Willows, both indigenous and exotic, from all quarters; carefully noting their peculiar uſes and properties; diſtinguiſhing the truly wild from the naturalized, or merely cultivated kinds; and watching them with a moſt diſcriminating eye through all their ſtages of growth in his garden, which is fortunately ſituated ſo as to be peculiarly favourable for the purpoſe.

Linnæus begins his arrangement of the *Salices* with thoſe ſpecies which have ſome peculiarity in their ſtamina, and our Britiſh writers follow him in this diſtribution. It is not my deſign to diſturb it. All ſuch as, inſtead of the 2 diſtinct ſtamina of Willows in general, have their filaments united into one, or have more than 2 ſtamina, have ſmooth ſerrated leaves, and therefore ſtand commodiouſly enough at the head of this firſt ſection.

The *Salix hermaphroditica* I believe has no right to a place among Britiſh plants. Hudſon introduces it only with a mark of doubt. The *Salix latifolia folio ſplendente* of Ray ſeems, by Dillenius's remark, to be a variety of the Sallow. The real *hermaphroditica* of the Linnæan herbarium is cloſely allied to *S. pentandra*, except in the fructification, and has never been detected in Britain. All that I have found in the gardens under that name is merely a broad-leaved variety of *S. pentandra*, the flowers of which are pentandrous and dioecious. The true *hermaphroditica* has but 2 ſtamina, and thoſe in the ſame flower with the piſtillum. I have never ſeen it alive, nor do I believe it to be known out of Sweden.

The

The firſt ſpecies on our liſt of Britiſh Willows is the

1. Salix *purpurea.*

Bitter Purple Willow.

S. monandra, foliis obovato-lanceolatis ſerratis glabris, ſtigmatibus breviſſimis ovatis ſubſeſſilibus.

Salix purpurea, *Linn. Sp. Pl.* 1444. *Hudſ.* 427.

S. monandra. *With.* 45. *Curt. Lond. faſc.* 6. *t.* 71. *Hoffm. Sal. v.* 1. 18. *t.* 1. *f.* 1, 2. *t.* 5. *f.* 1. *t.* 23. *f.* 1.

S. humilior, foliis anguſtis ſubcæruleis, ex adverſo binis. *Raii Syn.* 448. *Cant.* 144. *n.* 5.

In paluſtribus, et ad fluvios. Fl. Martio.

This is a buſhy ſhrub, three or four feet high, with long, ſlender, tough, purple, ſhining branches. The leaves are either oppoſite or alternate, nearly linear, but broadeſt upwards, ſerrated chiefly towards the ſummit, very ſmooth, glaucous beneath, deſtitute of ſtipulæ. The male catkins are very ſlender, ſcarcely an inch long, nearly ſeſſile, conſiſting of many thick-ſet flowers, the uppermoſt of which expand firſt. Scales black at the tip, hairy. Nectary a ſolitary gland oppoſite to each ſcale. Stamen one ſolitary ſimple filament, never dividing, bearing an orange-coloured double, or four-lobed, anthera. Female catkins exactly like the male in ſize and form. Germen ſeſſile, ſmall, of an ovate or rather elliptic form, ſilky. Style very ſhort, or ſcarcely any. Stigmas ſmall, ſeſſile, ſomewhat ovate, undivided, marked with a longitudinal furrow on the upper ſide. Capſule ovate, ſmall, ſilky.

The leaves and twigs of this ſpecies are extremely bitter, and therefore authorize the Engliſh name given by Mr. Curtis, who has well

well figured and deſcribed the ſpecies, though he erred in confounding it with the following.

2. SALIX *Helix.*

Roſe Willow.

S. monandra? foliis lanceolatis acuminatis ſerrulatis glabris, ſtylo elongato filiformi, ſtigmatibus linearibus.

Salix Helix. *Linn. Sp. Pl.* 1444. *Hudſ.* 427. *Dalech. Hiſt.* 277. *f.* 2.

S. n. 1640. *Hall. Hiſt. v.* 2. 306.

Salicis racemi ſeu nucamenta, roſæ et capitula ſquamata. *Bauh. Hiſt. v.* 1. *p.* 2. 213.

In ſalicetis et paluſtribus. Fl. Martio, Aprili.

Haller and Ehrhart ſeem to have led Prof. Hoffmann into the error of confounding this with the preceding, from which it is moſt unqueſtionably very diſtinct. Mr. Curtis, and ſome of our more recent writers, have followed Hoffmann, perhaps without having ever ſeen the true *S. Helix.* I am obliged to Mr. Crowe for firſt pointing out to me the different heights of the two plants, and different ſizes of their catkins, and on a critical examination of the female flowers, I was ſo fortunate as to find further marks of diſtinction.

S. Helix riſes to the height of 9 or 10 feet, and is a ſmall ſlender tree. Even in the form of its leaves it differs from the *purpurea*, thoſe of the *Helix* being more truly lanceolate and taper-pointed, by no means obovate. From the ſize which Haller aſcribes to his *Salix n.* 1640, I venture to preſume he intended this plant, and not the *purpurea*, and therefore borrow from him the character *monandra*, for I have never ſeen the male of this ſpecies. It is extremely probable moreover, from the cloſe affinity of the two in other

reſpects, that they ſhould agree in this. The female catkins are ſomewhat longer, and twice as thick, as in the laſt, and ſtand on longer ſtalks. The germen is ſeſſile, ovate and ſilky, but the ſtyle is conſiderably lengthened out, quite ſmooth and naked. The ſtigmas alſo, inſtead of being ſhort and ovate, are linear and conſiderably elongated. To theſe ſatisfactory marks may be added that the leaves are leſs glaucous beneath, and not ſo bitter as thoſe of the *S. purpurea.*

3. Salix *fiſſa.*

Baſket Oſier.

S. monadelpha, foliis lanceolatis acutis ſubdenticulatis glabris: ſubtùs glaucis.
Salix fiſſa. *Hoffm. Sal.* v. 1. 61. t. 13, 14.

In ſalicetis. Fl. Aprili, Maio.
In ſeveral oſier-grounds near Lynn, Norfolk. *Mr. Crowe.* At Prickwillow near Ely. *Rev. Mr. Hemſted.* At Fincham, Norfolk. *Rev. Joſeph Forby.*

This is a ſhrub 4 or 5 feet high, with upright, flexible and very tough branches, of a yellowiſh aſh-colour, often purpliſh. Leaves alternate, on footſtalks, lanceolate, pointed, 2 or 3 inches long, minutely toothed, or ſomewhat ſerrated, principally towards the top; ſmooth on both ſides except when very young; glaucous beneath; dark-green above. Stipulæ none. Catkins on ſhort ſtalks, cylindrical, blunt, firſt red, then yellow, flowering firſt at the top. Stamina 2, united from the baſe about half way to the top. Antheræ of 2 lobes, yellow. Germen ovate, acute, hairy. Style ſhort. Stigmas oblong, blunt, undivided.

This is cultivated in the fens, and preferred above all other Willows or Oſiers for the fineſt kinds of baſket work. Female plants only have hitherto come under my inſpection, but, by a peculiar inſtance of good fortune, I laſt ſpring met with one or two male flowers at the baſe of a few female catkins in Mr. Crowe's garden. Theſe enabled me to complete my deſcription, and at the ſame time removed every poſſible doubt of our plant being the *S. fiſſa* of Hoffmann, with every part of whoſe excellent deſcription it accords.

4. SALIX *rubra.*

Green Oſier.

S. monadelpha? foliis lineari-lanceolatis elongatis acutis denticulatis glabris: ſubtùs concoloribus.

Salix rubra. *Hudſ.* 428. *With.* 49.

S. vireſcens. *Villar's Dauph. v.* 3. 785. *t.* 51. *f.* 30.

S. minimè fragilis, foliis longiſſimis utrinque viridibus non ſerratis. *Raii Syn.* 449.

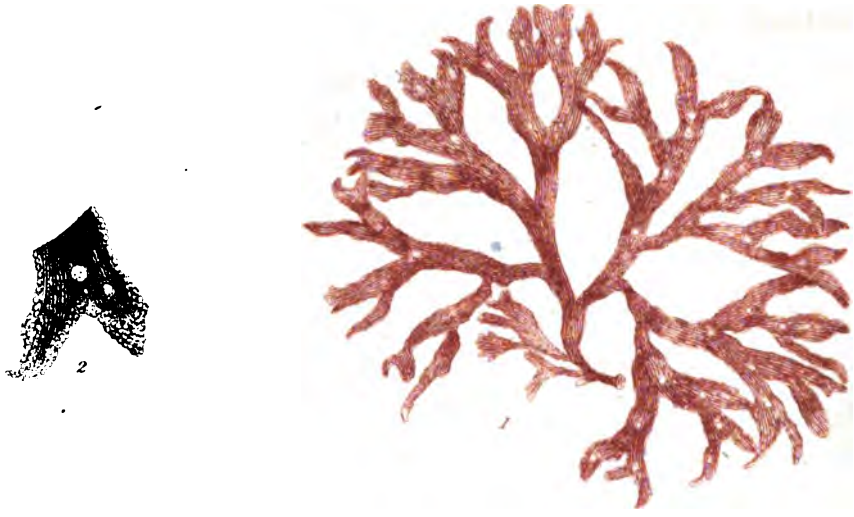
S. nerii folio utrinque virente. *Vaill. Par.* 175.

In ſalicetis rarius, Fl. Aprili, Maio.

Between Maidenhead and Windſor, and near Saliſbury. *J. Sherard.* In an oſier-holt near Ely. *Rev. Dr. Goodenough.* At Prick-willow near Ely. *Rev. Mr. Hemſted.* Near Bedford. *Rev. Mr. Abbot.*

The branches of this ſhrub are very long, ſlender, tough, ſmooth, gray or purpliſh. Leaves about 4 inches long when full-grown, linear-lanceolate, narrow, acute, ſlightly toothed or ſerrated, by no means entire, of a bright green on both ſides, not at all glaucous, ſmooth in general, ſometimes ſprinkled with a few ſlender hairs beneath. Stipulæ, if preſent, linear-lanceolate, a little toothed; but

Fucus ruscifolius



Fucus crenulatus

but generally wanting. The male catkins I have not ſeen. I preſume them from analogy to have monadelphous ſtamina. The females differ but little from the preceding, except in having rather thicker, almoſt ovate, ſtigmas.

This ſpecies appears to be but little known, though among the moſt valuable as an Oſier. The habit of the plant, figure and length of its leaves, agree with the Common Oſier *S. viminalis;* but their bright green colour on both ſides, and want of all pubeſcence, except when very young, render them eaſily diſtinguiſhable from that ſpecies, while their great length, linear form, and narrowneſs, and their colour being not at all glaucous, prevent their being confounded with *S. fiſſa.*

Specimens obligingly communicated by my friend Mr. Lambert, V. P. L. S. from Mr. Hudſon's own herbarium, have removed all uncertainty as to its being his *S. rubra.* The name is leſs appoſite than might have been wiſhed: *virens* or *concolor* would better have expreſſed the peculiar character of the ſpecies. Of the ſynonym of Ray there can be no doubt. That of Vaillant I learned from the Sherardian herbarium.

5. SALIX *Croweana.*

Broad-leaved Monadelphous Willow.

S. monadelpha, foliis ellipticis ſubſerratis glaberrimis: ſubtus glaucis.

In paluſtribus. Fl. Aprili, Maio.
At Cranberry Fen in the pariſh of Eaſt Winch, and in other parts of Norfolk. *Mr. Crowe.*

This ſcarcely riſes to the height of a tree. The branches are ſhort and ſpreading, rather brittle, clothed with a ſhining yellowiſh

or purpliſh bark. Leaves on footſtalks, elliptical, or inclining to obovate, ſomewhat pointed, ſcarcely an inch and half long, ſlightly ſerrated or rather crenate, ſmooth on both ſides; bright-green and ſhining above; glaucous and veiny beneath. Catkins nearly ſeſſile, of a ſhort ſomewhat ovate form. Scales obovate, black, very hairy. Stamina pale lemon-coloured, longiſh, their filaments united from the baſe to a greater or leſſer diſtance, ſometimes almoſt to the top. Antheræ reddiſh. The female flowers are as yet unknown.

This ſpecies of *Salix* ſeems to have eſcaped the notice of every botaniſt hitherto, and I have given it the name of its diſcoverer. It is moſt certainly very diſtinct from all others, and eaſily known by its united ſtamina, and ſhort broad leaves. It is deſtitute of the valuable properties of an Oſier, having ſhort and rather brittle, not long and flexible, twigs. It has therefore to all appearance never been cultivated, but is truly wild in Norfolk.

6. SALIX *triandra.*

Long-leaved Triandrous Willow.

S. triandra, foliis lineari-oblongis ſerratis glabris, germinibus pedicellatis.

Salix triandra. *Linn. Sp. Pl.* 1442. *Hudſ.* 425. *With.* 45. *Curt. Lond. faſc.* 6. *t.* 72. *Hoffm. Sal. v.* 1. 45. *t.* 9. 10. *t.* 23. *f.* 2.

S. folio amygdalino utrinque aurito, corticem abjiciens. *Raii Syn.* 448.

In ſalicetis et ad ripas fluviorum frequens. Fl. Maio, etiam Auguſto.

This is naturally a tree 30 feet or more in height, but being one of the beſt Oſiers for the uſe of baſket-makers, is generally cut and kept low. The bark of the ſtem and branches peels off ſponta-neouſly, almoſt like that of the plane-tree. The branches are up-right,

right, long, ſlender, pliable and tough, though ſomewhat brittle at their inſertion; their bark is browniſh and ſmooth. Leaves about 3 or 4 inches long, of a linear oblong figure, tapering away towards the baſe, and their breadth on each ſide the nerve is as nearly equal as poſſible; they terminate in a point; their margin is thickly ſerrated, the ſerratures incurved and rounded, a little glandular; both ſides ſmooth, the under rather glaucous. Stipulæ ovate, oblique, crenate, veiny, ſmooth, often wanting. Catkins at the ends of ſmall leafy young branches, erect, ſlender, yellowiſh, with blunt downy ſcales. Stamina generally 3 to each ſcale, very rarely (in the ſame catkin) only 2. Germen ſtalked, ovate, pointed, warty. Stigmas ſhort, ſpreading, notched. Capſule very ſmooth, green.

7. Salix *amygdalina.*

Broad-leaved Triandrous Willow.

S. triandra, foliis ovatis obliquis ſerratis glabris, germinibus pedicellatis, ſtipulis maximis.
Salix amygdalina. *Linn. Sp. Pl.* 1443. *Hudſ.* 426. *Lightf.* 596.
S. folio auriculato ſplendente flexilis. *Raii Syn.* 448. *Cant.* 144.

In ſalicetis et paluſtribus. Fl. Aprili, Maio.
On Badley moor by Dereham, Norfolk. *Mr. Crowe.*

Moſt botaniſts confound this with the preceding, and I ſhould ſcarcely have eſcaped the ſame error but for the obſervations of Mr. Crowe, who was led to inveſtigate their botanical diſtinctions by the different qualities of the two plants for œconomical purpoſes. This is but rarely preſerved in oſier grounds, being a bad Oſier, greatly inferior to the true *S. triandra.* It never riſes into a tree. The bark indeed is deciduous, as in the preceding, which added to the triandrous flowers, perhaps led Mr. Curtis and others to ſuſpect there exiſted

exiſted no ſpecific difference between the two. The leaves however will ſufficiently ſerve to diſcriminate them. Thoſe of *S. amygdalina* are ſhorter, ſcarcely 2 inches long, of a broadiſh ovate figure rounded at the baſe, by no means linear; they are moreover oblique, the width of the two ſides being unequal. The ſtipulæ are remarkably large, varying from a roundiſh to an half-heartſhaped form, crenate, deciduous. Female flowers and capſules much like thoſe of the laſt ſpecies.

8. SALIX *pentandra*.

Bay-leaved Willow.

S. pentandra, foliis elliptico-lanceolatis crenulatis glabris, germinibus glabris ſubſeſſilibus.

Salix pentandra. *Linn. Sp. Pl.* 1442. *Hudſ.* 426. *With.* 46. *Lightf.* 595.

S. folio laureo, ſeu lato glabro odorato. *Raii Syn.* 449.

Ad rivos Angliæ ſeptentrionalis et Scotiæ auſtralis. Fl. Maio, Junio.

The ſweet or bay-leaved Willow is ſufficiently well known by its broad odoriferous leaves, whoſe ſerratures exude a copious yellow reſin, and its numerous ſtamina, which are commonly about 5 to each flower. We have only to remark that the variety β of *Fl. Suevica* ſeems to be a diſtinct ſpecies, not yet found in England.

9. SALIX *nigricans*.

Dark broad-leaved Willow.

S. foliis elliptico-lanceolatis crenatis glabris ſubtùs glaucis, germinibus pedicellatis lanceolatis acuminatis ſericeis.

Salix

Salix phylicifolia β. *Linn. Sp. Pl.* 1442. *Fl. Lapp. ed.* 2. 291. *t.* 8. *f.* c. *n.* 350.

In ſalicetis Fl. Aprili.

At Wrongay fen, Norfolk, and in oſier grounds in other places not uncommon. *Mr. Crowe.*

No writer except Linnæus appear to have known Willow, this but he ſurely has erred in making it a variety of his *phylicifolia*, from which it differs in the much greater ſize of all its parts, as well as in the totally different form of its ſerratures, a part ſo peculiarly characteriſtic in the *phylicifolia*.

This ſpecies I have named *nigricans* from the dark colour of its branches, as well as its black hue when dried, which laſt indeed is not abſolutely peculiar to it. The trunk ſcarcely riſes to the height or form of a tree. The branches are upright, round, rather brittle, ſmooth. Leaves 2 or 3 inches long, elliptic-lanceolate, acute, a little rounded at the baſe, crenate in almoſt every part, but more ſlightly in the female plant; dark-green and very ſmooth above; glaucous, veiny, rarely a little hairy beneath. Foot-ſtalks very broad at their baſe. Stipulæ (if preſent) rather large, obliquely heart-ſhaped, ſerrated, ſmooth. Catkins from an inch to an inch and half long, thickiſh, with obovate, brown, hairy ſcales. Stamina 2, diſtinct, more or leſs hairy about their baſe. Style ſhort, ſmooth. Stigmas thick, ovate, united at their baſe, permanent, undivided. Capſules on footſtalks, long and tapering, clothed with white ſilky down, as are the general and partial ſtalks.

The leaves in the female plant are ſhorter, and leſs crenate, as well as more tapering towards the baſe. Such differences between the two ſexes of Willows are rare, but I can hardly conceive theſe to be different ſpecies, as they agree in every part beſides.

10. SALIX *laurina.*

Shining dark-green Willow.

S. foliis ellipticis acutis denticulato-ſerratis glabriuſculis ſubtùs glaucis, germinibus pedicellatis lanceolatis ſericeis.

In ſalicetis et paluſtribus. *D. Dickſon.* Fl. Aprili, Maio.

Very nearly related to the laſt, but certainly a diſtinct ſpecies. It eſſentially differs in the male catkins, which are but half the ſize of thoſe laſt deſcribed, and their ſtamina are ſhorter, perfectly ſmooth, not hairy at their baſe. The leaves alſo are of a brighter green, their margin inclined to be revolute, and rather toothed than crenate. The germen alſo is ſhorter, blunter, and leſs tapering.

Neither of theſe Willows is known to be of any particular uſe. Their branches are not endued with much flexibility or toughneſs.

11. SALIX *petiolaris.*

Dark long-leaved Willow.

S. foliis lanceolatis ſerratis glabris ſubtùs glaucis, germinibus pedicellatis ovatis ſericeis, ſtigmatibus ſeſſilibus bilobis.

In ſalicetis et paluſtribus. *D. Dickſon.* Fl. Aprili.

This ſpecies has not been found wild in Norfolk, but was ſent to Mr. Crowe by Mr. Dickſon, along with the laſt, as of Britiſh growth. It has moſt affinity with the two preceding ſpecies, but has longer and more ſlender twigs. The leaves are 4 or 5 inches long, about an inch broad, lanceolate, pointed, ſerrated, ſomewhat revolute, generally a little unequal at the baſe; bright-green, ſmooth and ſhining above; glaucous beneath, and ſometimes a little hairy.

hairy. In drying they turn of a purpliſh black. The footſtalks are peculiarly long, linear, and ſlender, ſilky on the upper ſide. Stipulæ ſmall, creſcent-ſhaped, toothed, ſmooth. The female catkins, the only ſex I have ſeen, are ſcarcely an inch long, with black, hairy, obovate, often notched, ſcales. Germens on long footſtalks, ſmall, ovate, ſilky. Stigmas perfectly ſeſſile, ovate, obtuſe, divided into two lobes.

12. SALIX *phylicifolia.*

Tea-leaved Willow.

S. foliis lanceolatis undulato-crenatis glabris ſubtùs glaucis, ſtipulis ſublunatis.

Salix phylicifolia α. *Linn. Sp. Pl.* 1442. *Fl. Lapp. ed.* 2. 291. *t.* 8. *f. d. n.* 351.

In alpibus Scoticis. Fl. Maio.
At Finlarig, Bredalbane. *Rev. Mr. Stuart.*

I am enabled to add this to the liſt of Britiſh plants, by means of a ſpecimen ſent to Mr. Lightfoot by Mr. Stuart, of Luſs, and now preſerved in his herbarium, among others which the author of the Flora Scotica had not ſufficient materials to decide upon. Having confronted with this the original Lapland ſpecimen of Linnæus, I can ſpeak with certainty to their being exactly the ſame. Unfortunately the fructification is wanting in both, but their leaves are ſufficient to mark the ſpecies.

S. phylicifolia appears to be a ſhrub with ſmooth, ſlender, ſpreading branches. Leaves alternate, ſtalked, exactly lanceolate, rather acute, furniſhed, about the middle principally, with broad and unequal crenatures, between which the leaf is as it were almoſt ſinuated; the margin is a little more thickened than ordinary; the baſe

and extremity of each leaf are entire, deſtitute of glands: all the leaves are either perfectly ſmooth in every part, or a little ſprinkled with minute inconſpicuous hairs; dark-green above; glaucous and reticulated with veins beneath. Footſtalks ſlender, ſmooth. Stipulæ creſcent-ſhaped, moſtly ſerrated, various in ſize.

To the tribe which this paper is intended to illuſtrate belong (beſides a few ſmaller ſpecies, which have little affinity with thoſe already mentioned) two well-known trees, the *S. vitellina* and the *S. fragilis*. Theſe will have a place in the *Flora Britannica*, though it may be doubted whether the former be really indigenous. As, however, I have nothing new to ſay concerning them, but, on the contrary, am waiting for more information than I have yet been able to obtain concerning the fructification of both, I will not add to the length of this treatiſe by any imperfect deſcriptions. Some remarks of Profeſſor Hoffmann lead me to ſuſpect we may have more than one ſpecies in England under the name of *fragilis*, but that I muſt leave for future inquiry.

My worthy friend the Rev. Mr. Abbot of Bedford, ſo well-known to this Society, has favoured me with one, if not two, entirely new Engliſh Willows, which belong to this firſt ſection of the genus, and which promiſe to be important in an œconomical view. I lament that the want of their fructification, and a longer time to obſerve their growth and different appearances, oblige me to poſtpone any further mention of them at preſent.

EX. *De-*

IX. *Descriptions of four new Species of Fucus.* By Dawson Turner, M. A. F. L. S.

Read May 5, 1801.

ALTHOUGH the numerous individuals comprehended under that extensive family known by the name of *Fucus*, and especially such of them as are considered natives of Britain, have of late years been the subject of much inquiry, and have induced many most able botanists to exert their skill in the investigation of them, it nevertheless requires but a very slight acquaintance with the subject, to be fully persuaded that, without entering into laborious researches upon their internal organization, or the mode of their fructification, things hitherto almost entirely neglected, a wide field remains for future naturalists to display their ingenuity, in the determination of many even of those species which are most abundant upon every part of our Island. I should feel extremely sorry were this, or any similar observation, to be considered as detracting from the merits of those gentlemen, to whose exertions I have always had a pleasure in acknowledging that the science is most deeply indebted:—far from such an idea, my intention is only to say that our knowledge of the marine *algæ* is still in its infancy; and a stronger proof of the justice of this remark can hardly be adduced, than the common *Fucus vesiculosus*, from the varying appearances of which, Linnæus and some subsequent botanists have formed such an infinity of distinct species. Did this circumstance require further confirmation, it might possibly in some degree receive it from a consideration of the four

four plants to which it is my object, in the preſent paper, to call the attention of the Linnæan Society, and of which two only can properly be ſaid to be either altogether new, or even very uncommon; there being little doubt but the others will be found to be ſufficiently abundant, at leaſt upon the eaſtern ſhore of England, where their having remained ſo long unnoticed has ariſen chiefly from their having been regarded as varieties of ſome of their congeners, to which they are in reality very nearly allied. From theſe authors I ſhould not now venture ſo openly to differ, or rather ſhould expreſs my ſentiments with far greater diffidence, were not the plants which I have undertaken to deſcribe, and upon which I truſt that future inveſtigators will confirm my deciſion, eſpecially natives of the Yarmouth beach; and had not my attention been particularly directed to them, from almoſt the earlieſt period that I have made the marine algæ my ſtudy, by my inſtructor and coadjutor Mr. Wigg, upon whoſe knowledge of them the Society have heard too much from more able as well as more eminent botaniſts, to make it neceſſary for me in any wiſe to enlarge.

I had propoſed to myſelf to extend this paper to a greater length than my contracted leiſure will now admit, and, among other plants, to have included in it a figure of *Fucus fruticuloſus* of Jacquin, which, in company with Mr. Sowerby, I found not unfrequently upon the ſhores of the more weſtern counties; the excellent account however of this plant, given by the Baron de Wulfen, made ſuch an intention uſeleſs; and I am now induced to mention the circumſtance, only from a fear that my having abandoned the idea may have been the cauſe of leading my friend, Mr. Stackhouſe, into error, as I underſtand that, in the third faſciculus of his Nereis, the appearance of which may ſoon be expected, he has declined figuring this ſpecies from an idea that it would previouſly be done by me.

FUCUS

FUCUS *ruscifolius.*

F. caule ramoso alato; foliis oblongis obtusis planis integerrimis proliferis: venulis diaphanis catenatis.

TAB. VIII.

Fig. 1. Planta naturali magnitudine.
2. Folii capsuliferi extremitas lente aucta.

Inter rejectamenta maris apud Yarmouth in Norfolciâ. Perennis: Floret Januario Februario.

Radix fibroso-calloſa, furculifera. Frons bipollicaris, membranacea, tenerrima, e basi ramosa, caule nonnunquam brevi tereti filiformi prædita. Rami membranâ tenuissimâ utrinque alati. Folia in omnibus quæ adhuc mihi videre contigit exemplaribus, principio ovata, dein oblonga, semper obtusa; e costa iterum atque iterum prolifera. A Fuco Hypoglosso, cui proximè accedit, primo intuitu dignosci potest, non modo foliorum figurâ, verùm etiam structurâ totâ internâ, præsertimque lineis pellucidis, catenatis, plerumque simplicibus, quandoque ramosis et anastomosantibus, quæ a costâ utrinque copiosè oriuntur, et ad foliorum margines decurrunt, angulum cum costâ plùs minùs acutum servantes. Fructificatio, tubercula parva, globosa, in ipsâ costâ, præcipuè foliorum extremitatem versùs sita, quorum plurima sæpe in eodem folio: his dissilientibus, seminum minimorum, saturatè rubentium copia satis ampla ejicitur, et costæ utrique lateri, seriatim quasi dispositа, adhæret. Color plantæ sanguineus.

The resemblance of this plant to *Fucus Hypoglossum* is so extremely great, that, though I have been in the habit of observing it for many successive years, and can point out several circumstances in

which they eſſentially differ, I ſhould ſtill have felt very unwilling to deſcribe them as ſpecifically diſtinct, were it not for the curious lines of concatenated veins which I find both peculiar to this ſpecies, and conſtant in all the ſpecimens that have fallen under my obſervation. In a freſh ſtate theſe veins are ſo eaſily viſible, as to give the plant a ſtriated appearance; but when dried, eſpecially if faſtened upon paper, a good glaſs and ſtrong light are neceſſary to diſcover them. I have never been able to form a ſatisfactory opinion upon the office which they are intended to perform in the internal organization of the ſpecies; nor indeed is this a ſubject upon which, in our preſent knowledge of the marine algæ, it would be right to hazard a conjecture. I ſhall therefore content myſelf with obſerving, that they run from the midrib to the ſides of the leaf generally in parellel lines, but ſometimes branching and anaſtomoſing; that they are quite pellucid; and that they are interſected at regular diſtances with joints, like the filaments of *Conferva*. The colour of *Fucus ruſcifolius* is always much darker than that of *Fucus Hypogloſſum*; the leaves of a different form, and, particularly when young, very blunt; the texture of the membrane, under a powerful microſcope, diſſimilar; the ſtem far ſtronger; and the midrib more prominent as well as more viſible: to which is to be added, that the months of January and February are thoſe in which this plant bears its fruit, and in which it is moſt frequently ſeen upon the Yarmouth beach; whereas *Fucus Hypogloſſum* fructifies only in the ſummer, and never appears at any other part of the year. Hence I conclude, that the one is annual, the other perennial. I have a ſpecimen of *Fucus ruſcifilius* with the root completely fibrous; no tendency to which I ever ſaw in *Fucus Hypogloſſum*; but, this not appearing to be always the caſe, I have not conſidered a ſingle inſtance ſufficiently important to ground any part of the ſpecific diſtinction upon it. In the mode of fructifying, the two plants completely agree; and, as much

much has been already written upon that ſubject, the Society will perhaps excuſe me if I treſpaſs ſomewhat upon their time by a ſlight digreſſion reſpecting it. The fruit of *Fucus Hypogloſſum*, as is well known, is ſometimes found in ſmall globular capſules ſituated upon the midrib of the leaves, while in other ſpecimens no traces of theſe capſules are apparent, but minute dark ſeeds are diſcovered in two ſmall rows on each ſide of the midrib, and parallel to it: a circumſtance which with ſome botaniſts has given riſe to the conjecture that this Fucus may poſſibly be dioicous, while others have carried the matter ſo far as to wiſh to conſtitute two diſtinct ſpecies. The latter idea however is done away by plants being occaſionally found in which both kinds of fructification, as they are called, may be diſcovered upon the ſame plant; and the former ſuppoſition has always appeared to me equally ill-founded, from my once having examined a plant in which the capſule was actually burſting, and the ſeeds partly diſcharged. I have no heſitation in owning, that I never could account for theſe ſeeds, ſuppoſing them to be caſually ſcattered, adhering in ſuch regular lines as is always the caſe; nor can I ſee any reaſon for that part of the membrane upon which they are diſpoſed being of a darker colour, and apparently thicker ſubſtance, than the reſt of the leaf: theſe are difficulties which I hope other botaniſts will remove, but which do not appear to me of ſufficient importance to induce me to accede to the idea of Fuci being monoicous or dioicous. I am indeed on the contrary perſuaded that they prove nothing, as many other Fuci, among which are to be enumerated the following, have their ſeeds equally contained in capſules, and afterwards diſperſed upon the frond, though without the ſame appearance of regularity: theſe are *Fucus alatus*, *ovalis*, *daſyphyllus*, *articulatus*, *kaliformis*, *clavelloſus*, *tenuiſſimus*, and *pinnatifidus*. From a conſideration of theſe and other circumſtances, I have been led to conjecture, that in the above-mentioned

Fuci the capſules, when mature, burſt, and immediately die away; while the ſeeds, from that viſcidity which they are known ſo eminently to poſſeſs, adhere to the ſurface of the frond, till, upon the whole plant at the end of autumn paſſing into decay, they attach themſelves to the ſtems of the larger ſpecies, or rocks, as the force of the ſea carries them, and there remain fixed till the latter months of the following ſpring again awake their vegetative powers.

Excepting *Fucus Hypogloſſum* there is none in the Britiſh liſt with which *Fucus ruſciſolius* can poſſibly be confounded, and I ſhall therefore trouble the Society with no more upon the ſubject.

FUCUS *crenulatus.*

F. fronde planâ coriaceâ lineari dichotomâ; ramorum apicibus bifurcis oblongo-lanceolatis.

TAB. VIII.

Fig. 3. Planta naturali magnitudine.
4. Frondis apex lente auctus.

Habitat prope Durium flumen in Luſitaniæ littoribus; β apud Dubrem. D. L. W. Dillwyn.
Perennis? Floret Auguſto, Septembri.

Radix callus expanſus, fibrarum aliquot craſſiuſcularum rudimentis plerumque inſtructus. Frondes plurimæ, vix palmares, planæ, enerves, ſtipiti brevi, tereti inſidentes, latè expanſæ, undique dichotomæ, lineares, ſingulari modo, præſertim extremitates versùs, obtuſè, ſed et minutiſſimè crenatæ. Apices bifidi, angulis acutis, in lobos oblongo-lanceolatos deſinentes. Rami plurimi, nunquam proliferi. Fructificatio tubercula hemiſphærica, magnitudine ſeminis

minis rapæ, verrucoſa, pallidè rubentia, ſeminibus repleta, utrique frondis paginæ inſidentia. Subſtantia coriacea. Color e fuſco ſaturatè ſanguineus, fugaciſſimus, et in ſordido-flaveſcentem tranſiens.

Var. β. ſubſtantiâ tenuiore, margine integro, apicibus plerumque obtuſiſſimis.

In ſelecting for deſcription this Portugueſe Fucus, in preference to many more beautiful as well as more rare ſpecies, which my friends have been ſo obliging as to procure for me from foreign ſhores, I am actuated principally by the hope that it may thereby be in my power to throw ſome light upon the botany of my own country; what I conſider a variety of this having been found abundantly at Dover by my friend Mr. L. W. Dillwyn, and by him obligingly communicated to me in the courſe of the laſt autumn. When this plant becomes more generally known and underſtood, it may probably admit of well-founded diſcuſſion how far what I have now made a variety may not in reality be a diſtinct ſpecies; and I have little doubt but almoſt every botaniſt, who has only an opportunity of examining them in a dry ſtate, will immediately decide in favour of the latter opinion. For my own part, I can only ſay that I have had many ſpecimens of each under my obſervation, and that, after having frequently examined and compared them as attentively as was in my power, I could find no permanent difference between them; though the Engliſh plant is ſtrikingly diſſimilar at firſt ſight, in having the edges of the frond far more entire, the ends generally blunt and frequently emarginate, but neither of theſe are conſtant, and the angles of the forks much leſs acute. The final determination of this point muſt be reſerved for future inveſtigation: it is ſufficient for my purpoſe here to ſhow how this ſpecies differs from its congeners. *Fucus crenulatus* was brought me in ſuch quantity

from Oporto by a gentleman who gathered it there in the month of September 1798, that I can have very little doubt of its being one of the moſt common weeds of that ſhore. It is altogether a connecting link between two ſpecies, by no means nearly allied to each other, *Fucus criſpus* and *Fucus rubens*, with each of which it has many points in common, though ſufficiently removed from the one as well as the other. It agrees in texture and ſubſtance with the former, and in general habit with the latter, but may at firſt ſight be with eaſe diſtinguiſhed from both by the branches always preſerving their linear form, and being divided at the extremities in a manner ſomewhat ſimilar to thoſe of *Fucus bifidus*. The colour too, as far as I have obſerved, differs from that of every other Britiſh Fucus; of a dark red, inclining to brown, moſt rapidly changing, if expoſed to the air or kept in freſh water, to a dull dirty yellow: my Dover ſpecimens, when placed in a ſtrong light, are of a fine pink at the end of the frond. But the moſt ſtriking peculiarities of this ſpecies are the minutely crenulated edges, which cannot fail of being remarked by the moſt inattentive obſerver, and the fructification, which conſiſts of pale fleſh-coloured tubercles of the ſize of a pin's head, plentifully ſcattered upon each ſide of the frond, eſpecially towards the extremities, in their earlieſt ſtage immerſed, but ſoon burſting through the epidermis, and not continuing covered with it, as in all other ſpecies with which I am acquainted except *Fucus radiatus*, ſeſſile, of a ſubſtance inclining to ſpongy, and very different from the reſt of this plant: when dry they turn to a dark brown, and entirely loſe their natural appearance. The habit of this Fucus in a freſh ſtate appears to me to be much twiſted, and in ſome branches almoſt ſpiral. From analogy I have no heſitation in concluding that it is perennial, and Mr. Dillwyn's ſpecimens as well as thoſe brought me from Oporto leave no doubt as to its fructifying in the autumnal months.

FUCUS

Linn. Trans. VI. tab. 9. p. 133.

Fucus clavellosus

Fucus *clavelloſus.*

F. fronde filiformi ſubgelatinosâ ramoſiſſimâ; ramis confertis; ramulis ſubulatis ſubpinnatis, tuberculis axillaribus.

Tab. X.

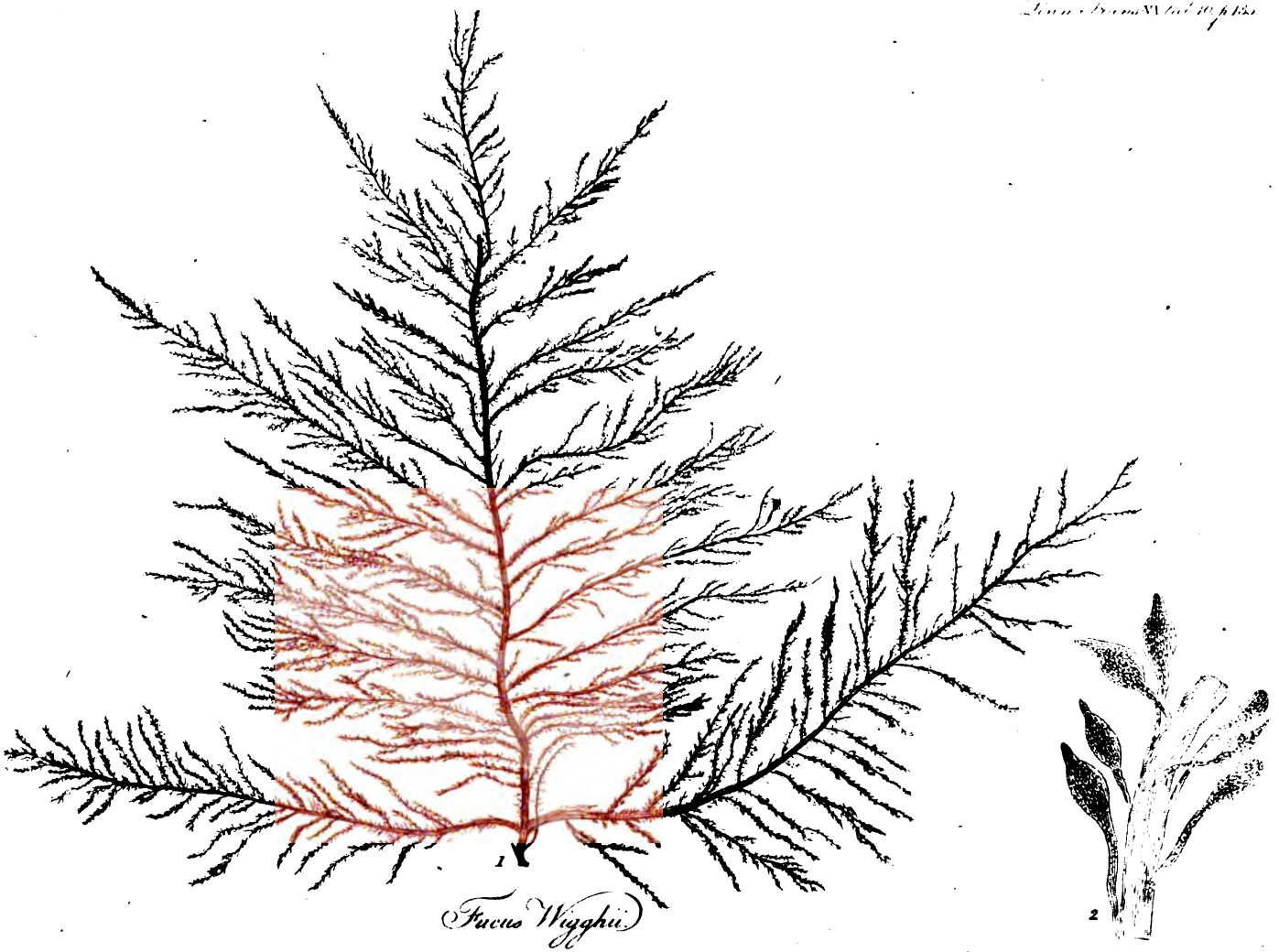
Fig. 1. Planta naturali magnitudine.
2. Ramulus cum capſulâ lentè auctus.
3. Ramulus alter ſeminibus diſperſis.

Habitat apud Brancaſter in Norfolciâ; inter rejectamenta maris apud Yarmouth frequens.
Annuus. Floret Julio, Auguſto.

Radix callus minutus. Frondes plurimæ, ferè ſpithamææ, filiformes, teretes, lubricæ, undique ramoſiſſimæ, ramis ramuliſque approximatis, longitudine variis, ſummis ferè pinnatis, ſubulato-clavatis, plerumque oppoſitis, nunquam vel verticillatis vel ita contractis ut articulati videantur. Frondis craſſities pennam paſſerinam rarò æquat. Fructificatio, tubercula minuta, nigricantia, e cordato-triangularia, inter ramulos minimos ſita, ſeminibus referta, quæ, capſulis marceſcentibus, ramulis inordinatim adhærent, ulvæque ſpeciem pro ſe ferunt. Color pallidè ruber.

For the information that the late Rev. John Lightfoot had intended to deſcribe the preſent plant as a diſtinct ſpecies, and had beſtowed upon it the trivial name of *clavelloſus*, I am indebted to the kindneſs of Sir Thomas Frankland; and, as this gentleman has abundantly found it upon the rocks at Scarbro', and long been in the habit of obſerving it, I muſt be allowed for the ſake of ſcience to expreſs the wiſh I have always felt that he would himſelf have undertak-

dertaken the deſcription and determination of it. The fate of this elegant Fucus has been peculiarly unfortunate, and the endeavouring to point out its ſpecific character is attended with ſingular difficulties; all authors upon the ſubject, with the exception of Mr. Lightfoot, to whom I preſume it was not known when he wrote his Flora, having conſidered it only as a varying appearance of *F. kaliformis*, and purpoſely drawn up their deſcription of that plant ſo as to include this ſpecies: a circumſtance far from ſurpriſing, as they are gathered upon different ſhores, ſo that few botaniſts well acquainted with the one are likely to have ſeen the other in its place of growth: the *Fucus kaliformis* being principally, if not entirely, confined to the weſtern ſhores of Great Britain, where I have no reaſon to believe that *F. clavelloſus*, a native of the coaſt from Norfolk to Northumberland, ever makes its appearance. As, during the months of ſummer, this latter is far from uncommon upon the Yarmouth beach, I have had an opportunity of watching it for ſeveral years, in the courſe of which I never, at any period of its growth, remarked a tendency to aſſume the appearance of the former; but being acquainted with that ſpecies only from having ſeen a few dried ſpecimens, I reſerved my opinion till my tour into Cornwall in the ſummer of 1799 gave me an opportunity of examining it plentifully in a recent ſtate, and ſatisfying myſelf that the plants are even more diſtinct when freſh than when expanded upon paper, and preſerved in herbaria. The points of difference are of a nature to be far more eaſily underſtood by a compariſon of ſpecimens, than by any language it will be in my power to employ; the moſt ſtriking of them depending upon the general habit, upon the greater ſize of *F. kaliformis*, and upon its branches, particularly the extreme ones, being verticillated, and at intervals ſo contracted as to give the whole plant a jointed appearance, very nearly reſembling *F. articulatus*, from which in ſome battered ſpecimens I



Fucus Wigghii

have had a difficulty in diſtinguiſhing it. Theſe marks, which are very obvious, will be altogether ſufficient to enable any botaniſt to determine between the plants; but I extremely regret that, when I had an opportunity of examining *F. kaliformis* freſh, I omitted ſubjecting the capſules to a ſtrong microſcope, and ſeeing if the ſeeds, which to the naked eye and in a dry ſtate appear round, be not in reality, as in *F. clavelloſus*, rather cordate. If they be not, and I wiſh thoſe naturaliſts who have it in their power would attend to this circumſtance, a ſufficient and perhaps more ſatisfactory difference is at once eſtabliſhed.

Fucus *Wigghii.*

F. fronde filiformi ſubgelatinosâ ramoſiſſimâ; ramis ramuliſque ſetaceis; ſetis in ſiliculas lanceolatas mucronatas extenſis.

Tab. X.

Fig. 1. Frons naturali magnitudine.
2. Ramuli particula lentè aucta.

Inter rejectamenta maris apud Yarmouth rariſſimè lecta.

Radix, ut in pleriſque huic proximis, callus minutus. Frons filiformis, teres craſſitie fili emporetici minoris, vix ſpithamæa, ramoſiſſima; rami ſæpiùs alterni, ramulis ita cincti ut pinnati quodammodo appareant: omnes, tàm maximi quàm minimi, ſetis, ut ita dicam, cincti; quæ plerumque ſimplices, interdum autem ſunt bifurcæ, interdumque, ſed rariſſimè, ita diviſæ ut in ramulos novos tranſire videantur. Setæ hæ pedunculorum vice funguntur, ſiliculaſque parvas, ovato-lanceolatas, ſeminibus repletas, in mucronem deſinentes, ad extremitates ferunt. Semina ſaturatè rubra, minima, oculo niſi valdè armato, non diſcernenda. Pedunculi ſiliculis

ſiliculis duplò vel triplò longiores. Subſtantia e cartilagineo gelatinoſa, lubrica. Color totius plantæ fuſco-ruber.

A ſingle ſpecimen of this Fucus was found many years ago upon the Yarmouth beach by Mr. Wigg, to whoſe merit I feel a peculiar pleaſure in paying what I conſider the moſt public teſtimony in my power, by making it known to the botanical world under his name; and, as I think there cannot be the ſmalleſt doubt of its being totally diſtinct, not only from every Engliſh, but alſo from every other Fucus hitherto known, I truſt that, however uncouth the appellation I have beſtowed upon it, the Linnean Society will ſhare my feelings, and nevertheleſs ſuffer it under that title to deſcend to poſterity. Mr. Maſon and myſelf have ſince gathered it, though neither of us more than one plant, nor do I know that it was ever ſeen in any other part of the kingdom. The place which naturally belongs to it in the Britiſh liſt is immediately between *F. pedunculatus* and *F. aſparagoides*; but, as there is no fear of its being confounded with thoſe or any other ſpecies, and as I have in my ſpecific character included all the particulars reſpecting it with which I am acquainted, I ſhall add no more upon the ſubject, except that the pods containing the ſeeds ſeem to be, as in *F. ſinuoſus*, *laciniatus*, and many others, merely extenſions of the frond, which, when their office is fulfilled, ſtart forth into new branches.

X. *De-*

X. *Deſcription of Callicocca Ipecacuanha.*

By Felix Avellar Brotero, Profeſſor of Botany in the Univerſity of Coimbra, F.M. L.S.

Read February 3, 1801.

CALLICOCCA Ipecacuanha.

CALLICOCCA caule aſcendente, ſuffruticoſo, ſarmentoſo; foliis ovato-lanceolatis, infernè ſubpubeſcentibus; capitulo terminali, pedunculato; involucro tetraphyllo, foliolis ſubcordatis; corollis quinquefidis.

Tapogomeæ ſpecierum congener. *D. De la Marck. Illuſtr. Gen. Dict. Bot.*

Ipecacuanha fuſca. *Pif. Braſ. p.* 101. *It. Margr. Braſ. p.* 17.

Braſilienſibus aliis *Ipecacuanha*; aliis *Poaia do Matto*, in auſtralioribus Braſiliæ locis; *Cipó* aliis, uti etiam Portugallenſibus.

Pharm. Ipecacuanhæ fuſcæ ſ. brunæ Radix, aut Radix Braſilienſis ſ. antidyſenterica.

Radix perennis, ſimplex aut ſubramoſa, ſubteres, ſæpius perpendicularis, rarò leviter obliqua; duas, tres, quatuorve uncias et ultra longa; ſupernè gracilior, craſſitudine et ſimilitudine caulis, ſæpius hic illicve brevibus radiculis inſtructa (quarum una alterave interdum craſſeſcit); infernè duas treſve lineas craſſa, vagè flexa, extùs fuſca, ſubannulata, annulis prominentibus, inæqualibus, ſubrugoſis; ſapore acri, amaro, odore vix ullo, niſi herbaceo. Dum

ſicca, cortex craſſa, dura, fragilis, extùs bruna, intùs albicans, gomoſo-reſinoſa, filo percurſa lignoſo, æquali, albo, ferè inſipido, mucilagineo, a quo facilè in plures annulos fiſſa contiguos et inæquales, fiſſuris lævibus, ſeparatur; ſapore primùm farinaceo, poſteà ſubamaro, ſubacri, et ſemper minùs acri quàm in ſtatu viridi, ſeu vivo; odore vix ullo, ſed cum mortario contunditur, tenuis ejus pulvis ſubnaſeoſo nares odore afficit et uſque ad ſternutamentum ſtimulat.

Caulis ſuffruticoſus, ex procumbenti erectus, ad baſin, qua procumbit, interdum repens, teres, craſſitudine pennæ gallinaceæ, quinque ad novem uncias altus, infernè glaber, efoliatus, fuſcus, nodoſus (ubi a foliorum caſu cicatrices), internodiis ſurſùm verſus apicem indies decreſcentibus, ibique villoſus, viridis, foliatus, in primis plantæ annis ſimpliciſſimus aut ſimplex, poſteà ſarmentoſus, ſarmentis perpaucis efoliatis, ſubtortuoſis, procumbentibus, plùs minùſve dodrantalibus, nodoſis, ad nodos vagè radicantibus, ibique unum alterumve novum caulem, a primo aut alio ſemipedem et ultra diſſitum, producentibus.

Folia inferiora caduca, ita ut in plantæ floreſcentia 4, 6, aut 8 ſolùm, rariſſimè plura, ad apicem caulis perſiſtant; oppoſita, patentia, ovato-lanceolata, nonnulla interdum ferè obovata, tres ad quatuor uncias longa, unam ad duas ferè lata, integerrima; ſupernè ſaturatè viridia, punctis ſcabriuſculis aſperſa, glabra, rarò vagè ſubpubeſcentia; ſubtùs ex viridi-albida, ſubpubeſcentia, coſtâ parùm elevatâ, venis lateralibus alternis, ſubparallelis, ad apicem curvatis: petiolus folii laminâ brevior, 2, 3-ve lineas longus, canaliculatus, ſubvilloſus.

Stipulæ geminæ, laterifoliæ, appreſſæ, ſeſſiles, ſublineares, partito-fimbriatæ, lacinulis ſubulatis, petiolis leviter adnatæ, illorum longitudine aut vix longiores, cum ipſis caulem ſubvaginantes, marceſcentes.

Flores

Flores aggregati in capitulum ſolitarium, ſubnutans, caulem terminans, pedunculatum; pedunculo tereti, pubeſcenti, petiolis longiore, plùs minùſve ſemiunciam alto: floſculi ſeſſiles, 15 ad 24, bracteolis diſtincti; bracteolæ involucri et floſculorum longitudine, pubeſcentes, integerrimæ, ſeſſiles, virides, formâ ſæpe variantes, nunc ſubovatæ oblongiuſculæ, nunc lanceolatæ obtuſiuſculæ, nunc (quod rarius) formâ et magnitudine involucri foliolis ſimiles, et tunc floſculi ipſis numeroſiores.

Involucrum tetraphyllum; folioli ſubcordati, acuti, integerrimi, ſubſeſſiles, leviter undati, hirſuti; duo externi majores, omnes floſculis paulò longiores.

Cal. Perianthium membranaceum, albidum, breviſſimum, quinquedentatum, dentibus obtuſis, ſuperum, perſiſtens.

Cor. monopetala: tubus cylindraceus, longus, ſuprà parùm ampliatus, fauce et extùs lanuginoſus; limbus tubo brevior, quinquefidus, laciniis ovatis, acutis, recurvis.

Stam. Filamenta quinque, capillaria, brevia, ſupernè tubo inſerta. Antheræ oblongæ, lineares, erectæ, exſertæ.

Piſt. ovatum, inferum, non angulatum. Stylus filiformis, longitudine tubi corollæ; margine nectarifero brevi ad baſin cinctus. Stigmata duo, oblonga, craſſiuſcula, obtuſa, antherarum longitudine.

Peric. Bacca unilocularis, diſperma, ex ovali-ſubrotunda, nec ſulcata, nec anguloſa, ſed lævis, calyce coronata, ex rubro-purpuraſcens, mollis, demùm corrugata, nigricans. Quæ immaturæ decidunt, ſiccanturque, ſunt ovales, utrinque (quà ſemina internè planâ facie contiguntur) uniſulcatæ.

Semina duo, elliptica, lævia, leviter torta, arillo nullo; hinc plana, lineâ parùm elevatâ mediâ longitudinali notata, inde convexa, ad

apicem uniſulcata. Teſta lignea, ſordidè albida; integumentum internum membranaceum, tenuiſſimum, teſtæ arctè adnatum: albumen teſtæ cavitati reſpondens, convexo-planum, cartilagineum, durum, ex fuſco-fulvum, hinc ad faciem planam ſulco longitudinali exaratum, inde læve; embryo dicotyledoneus, albumine brevior, erectus, dorſalis.

Habitat in ſolo umbroſo humoſoque ſylvarum, in Pernambuquiâ, Bahiâ, Riojanæriâ, Paulenſiâ, Marianniâ, aliiſque Braſiliæ provinciis.

Floret Nov. Dec. Jan.; nec non Februario aut Martio; baccæ Maio matureſcunt.

Radicis vires medicæ ſat cognitæ.

Hæc omnia non plùs ex meis obſervationibus in plantis ſiccis mihi miſſis, quàm ex aliis in plantis vivis in Braſiliâ iterùm atque iterùm factis a D. Bernard. Bnt. Gomes, Botanicæ Medicæ diligentiſſimo, et mecum benignè communicatis, teneo.

EXPLICATIO TAB. XI.

Fig. A, B. Caules duo ex ſarmento orti.
C. Sarmentum unum.
D, E. Duæ radices.
1. Una ſtipula cum duobus petiolis; in uno folii baſis adeſt.
2, 3. Duo foliola involucri, unum ex majoribus, aliud ex minoribus.
4, 5. Bracteolæ interflorales.
6. Corolla magnitudine naturali, germini impoſita.
7. Eadem lente aucta, uti et calyx et germen inferum.
8. Eadem ſciſſa et aperta ut videantur antheræ.
9. Germen, calyx, ſtylus et ſtigmata, lente aucta.

D

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Fig. 10. Bacca magnitudine naturali.

11. Eadem tranſversè ſecta, ut loculus et ſemina duo videantur.

12. Bacca immatura utrinque uniſulcata.

13, 14. Semina leviter torta, magnitudine naturali, ſed hìc plus torta quàm in naturali ſtatu, pictoris negligentiâ.

15, 16. Nucleus ſeminis, avulsâ teſtâ.

XI. *Obſervations on the Curculio Trifolii, or Clover Weevil, a ſmall Inſect which infeſts the Heads of the cultivated Clover, and deſtroys the Seed. In a Letter to Thomas Marſham, Eſq. Tr. L. S. by William Markwick, Eſq. F.L.S. With additional Remarks by Mr. Marſham.*

Read February 3, 1801.

DEAR SIR,

THE very polite and obliging attention ſo frequently ſhown by you to my trifles in Natural Hiſtory, encourages me to trouble you with this letter, to be laid, if you think proper, before the Linnean Society; and ſhould they diſcover in it any thing that at all tends to improve the ſcience, or that may be in any other reſpect uſeful, I ſhall feel myſelf highly gratified.

Having ordered a field of clover, conſiſting of about eight acres, to be ſaved for ſeed, my ſervant, on the 9th of Auguſt laſt, aſked me whether I choſe to ſave the whole field for that purpoſe, ſaying that he had examined ſeveral of the heads, and found the maggot in them. On this information I was induced to order only a part of the field to be ſaved for ſeed, and the reſt to be mowed for hay. Soon after, I went myſelf to examine the ſtate of the clover, and found in many of the heads ſeveral ſmall white maggots or larvæ, invariably placed on the outſide of the baſe beneath the individual calyx of each floret, eating through the bottom, and thereby deſtroying the germen or rudiment of the future ſeed. Each of theſe larvæ appeared to be exactly ſimilar in ſhape and colour (only much ſmaller) to the nut maggot, having a white body, black head, and,

and, as I at firſt imagined, no legs; but I have ſince diſcovered, on a cloſer inſpection aſſiſted by glaſſes, near the head, three ſmall white ſcales or prominences on each ſide, which I ſuppoſe may ſupply the place of legs, in this minute inſect. See TAB. V. fig. a. A. I traced it through its chryſalis to its imago or perfect ſtate, in the following manner. Having placed a number of the blighted heads of the clover in a box, which was carefully covered with gauze to prevent any inſect from getting either in or out, I found, on opening the box on the 19th of the ſame month, a great number of ſmall blackiſh weevils running about in it, and on inſpection diſcovered many of their chryſalids, ſticking to the ſtem at the baſe of the individual floret, exactly in the ſame ſituation as I had before found the larvæ; nay, I even ſaw one or two of theſe weevils crawl out from their chryſalids.

Under theſe circumſtances there can be no doubt that the before-mentioned larva changes to a ſmall white chryſalis, which differs but little from it, except in being egg-ſhaped and motionleſs; and this produces a ſmall blackiſh weevil with a long beak, whitiſh belly, and yellow legs.

With regard to the quantity of damage done by this little deſtructive inſect, I know of no better way of aſcertaining it, than by taking a comparative view of two of my crops, which grew in two fields adjoining to each other, and which appeared to be equally good with reſpect to the growth of the plan s, but very different in the produce of ſeed: this will leave but little doubt that the deficiency of this year's crop has been occaſioned by the devaſtations of theſe inſects, which abounded in an aſtoniſhing degree. This I ſhall do with as much accuracy as I can.

In the year 1798 I grew on nine acres of ground (juſt double the quantity that was ſaved for ſeed this year) either thirty-three or thirty-four buſhels and a half of clover ſeed, of which twenty-eight

buſhels and a half were ſold for fifty ſhillings per buſhel, and the reſt, amounting to either five or ſix buſhels (I am not quite certain which), was kept for my own uſe; ſo that, taking it at the loweſt, the ſtatement will ſtand thus:

	Buſhels.		£.	s.	d.
In 1798 four acres and a half, being half of the crop,	produced $16\frac{3}{4}$	which ſold for	41	17	6
This year (1800) the ſame quantity of ground produced only	$7\frac{1}{2}$	worth at ſame price	18	15	0
Deficient	$9\frac{1}{4}$	worth	23	2	6

Thus it appears that the loſs on this year's crop is very great, occaſioned, moſt probably, by the depredations of this inſect; and beſides, what ſeed I have is of an inferior quality.

The ſpecies of clover ſown in both theſe fields was the common purple or honey-ſuckle clover, which I take to be no other than the *Trifolium pratenſe* of Linné improved by culture.

I am, &c.

REFERENCES TO THE FIGURES.

TAB. V. Fig. a. The larva of the natural ſize.
A. The ſame magnified.
b. The chryſalis of the natural ſize.
B. The ſame magnified.
c. The weevil of the natural ſize.
C. The ſame magnified.
d. The individual calyx with the larva eating through its bottom, magnified.

The

The foregoing obſervations of Mr. Markwick furniſh another inſtance of the deſtructive property of inſects to the agriculture of this country, prove the neceſſity, particularly at this time, of a minute inveſtigation into the cauſes of the failure of crops, and fully evinces that the practical entomologiſt is a valuable member of ſociety; as, by diſcovering the œconomy and perfect hiſtory of theſe minute deſtroyers, and aſcertaining, as much as poſſible, the injury they do, we may either be enabled to diſcover a remedy to the evil, or to diſſipate our fears when we perceive, as in the caſe of the wheat inſect ſo fully deſcribed by this gentleman and Mr. Kirby, that Providence has ſet bounds to their miſchief, and provided a ſuitable check to prevent its increaſe. The inſect here mentioned has been deſcribed by ſeveral authors, ſome of whom have given a figure of it; but they all appear to have been unacquainted with its hiſtory except the great Linné, for it is without doubt the *Curculio Trifolii* of that celebrated naturaliſt, and deſcribed by him in the *Appendix Animalium, Syſt. Nat.* vol. iii. p. 224. where he ſays, "*Habitat* in Trifolii montani *ſpicis, intra quas declaratur.*" It is alſo, I preſume, the *Curculio flavipes* of Fabricius, *Syſtema Entomologiæ*, p. 133, n. 33, and of Paykul's Monograph, n. 135; but they only obſerve, "*Habitat frequens primo vere locis apricis calidioribus.*" Geoffroy calls it *le Becmare noire à pattes fauves*, in his *Hiſtoire Abrégée des Inſectes*, tom. i. p. 272, n. 8. and adds to the deſcription "*On le trouve ſur les fleurs.*" Fabricius in his *Entomologia Syſtematica emendata* has removed it from the genus *Curculio*, and attached it to that of *Attelabus*, in which he has been followed by Panzer in his *Entomologia Germanica*, p. 298, n. 22, and *Fauna Germanica* 20, tab. 13, but I think without reaſon, and they add nothing to its hiſtory. The latter author ſays "*Habitat in ſalice, populo, primo vere*;" but taking the *Habitat* merely from the plants on which inſects are found, without further examination, muſt frequently lead to error. I had examined this inſect in its per-

fect ſtate very minutely, and have deſcribed it in my manuſcript as follows:

CURCULIO *Trifolii.* Cur. ater, roſtro porrecto, pedibus ferrugineis: plantis nigris.
Long. corp. 1½ lin.
Habitat in Trifolio.

DESCRIP. Corpus atrum. Roſtrum thorace paulo longius. Antennæ piceæ. Thorax punctulatus. Elytra ſtriata. Pedes ferruginei, plantis ſemper nigris; eſt ubi tibiis nigris variat. Abdomen niveum.

T. M.

XII. *Further*

XII. *Further Obſervations on the Curculio Trifolii. In a Letter to William Markwick, Eſq. F.L.S. by Martin Chriſtian Gottlieb Lehmann, M.A. of Gottingen.*

Read February 3, 1801.

SIR,

WHEN you favoured me, laſt ſummer, with an account of the damage done to your clover by a number of little maggots, and permitted me to gather ſome of the injured flower-heads, I felt intereſted in the cauſe, and became anxious to obſerve the œconomy and changes of this little deſtructive animal, and by my obſervations, in addition to thoſe which you had ſent to the Linnean Society, to endeavour to complete the hiſtory of an enemy you had ſo unfortunately become acquainted with.

As far as my limited knowledge in the ſcience of entomology extends, nothing appears to have been hitherto publiſhed of the nature and habits of this inſect. The French naturaliſt Geoffroy, who firſt deſcribed the perfect animal, ſays it is found on flowers, and calls it *le Becmare noir à pattes fauves*, but takes no notice of its larva. Fabricius deſcribes it as an *Attelabus*, and obſerves "Habitat *primo vere frequens locis apricis calidioribus*;" which perfectly agrees with my own obſervation, for it was the firſt inſect I found laſt ſpring in a ſunny meadow near a ſhrubbery.

The blighted clover heads which I gathered in your grounds in Auguſt were, like all the reſt in the field, full of maggots of different

ſizes, which of courſe paſſed into their perfect ſtate at different periods from the middle of Auguſt until the end of September.

I preſerved half a dozen of them in a flower-pot covered with gauze, in which I had previouſly ſown ſome turnip ſeed. They fed a little upon the cotyledons of this plant, but ſeemed not inclined to perform that duty which nature has impoſed on them in their perfect ſtate. On the contrary, they ſoon retired to a ſecret corner of their priſon *above* the earth, where they remained in a quieſcent ſtate; and, after the firſt cold nights in October, appeared as if dead, but ſoon revived upon being brought into my warm ſtudy.

Few as theſe obſervations may appear, yet, added to your intereſting diſcovery, they may form an outline of the hiſtory of this little animal, which further and more accurate obſervations may complete.

Hatched between the calyces of the *Trifolium pratenſe*, the maggot penetrates with its head into the rudiments of the firſt ſeed, as yet in a liquid ſtate, and then proceeds to another more advanced and ſuitable to its increaſed ſtrength. Having conſumed 3 or 4 of them, it remains in the place of the laſt, where it is ſufficiently ſheltered, and changes like other weevils into the pupa or chryſalis ſtate, through the tranſparent ſkin of which an experienced eye may trace the different limbs of the future animal. After a few days the inſect comes forth in its imago or perfect ſtate, at firſt ſoft and white, but ſoon changing to a ſhining black colour, except the tibiæ and firſt joint of the antennæ, which remain yellow.

Having taken a ſhort meal, it ſlowly conceals itſelf in the ſmall holes of fences, or in the bark of trees, where it repoſes during the winter, if ſufficiently protected from its numerous enemies. Few however, happily, ſurvive; for it appears impoſſible that many ſhould eſcape the vigilance and dexterity of the wren, the redbreaſt, the nun,

nun, and other birds of the titmouſe kind (*Motacilla. Parus.*). Such as eſcape their bills are among the firſt partakers of the univerſal life which nature excites in the ſpring. Laſt year they appeared in Suſſex in the month of March, and, in addition to their numerous perſecutors, the *Staphylini* were then particularly formidable to them.

Surrounded by ſo many dangers, while feeding on the tender leaves of plants, they are employed in ſeeking their conſorts, until the heads of clover and perhaps other papilionaceous flowers break out, when the female depoſits on the cup of the ſwelling ſeed the egg that produces its deſtroyer.

The fecundity of this little inſect is ſo prodigious, that the maggots deſtroyed a whole field which the year before, when not a ſingle inſect of this kind was diſcovered, produced 70 pounds of ſeed. There is reaſon to believe, however, that the parents of thoſe millions were then in your grounds, as, the animal being not only deſtitute of wings but alſo very ſlow in its motion, it is not probable that it could have overrun your field to ſuch a degree from a diſtance in the courſe of one ſeaſon.

In the hiſtory of this, as in almoſt that of every other inſect, if obſerved with attention, the œconomy of nature appears wonderful. This little inſect ſeems deſigned to prevent the boundleſs increaſe of the trefoil, and is itſelf circumſcribed in its numbers by numerous enemies conſtantly on the watch to devour it. The female of this inſect could never lay a great number of eggs if ſhe had to ſearch for flowers ſparingly ſpread over a large field, as ſhe would in that caſe infallibly become a prey to ſome of her enemies; whereas in the clover field, where flower preſſes upon flower, ſhe may lay ten thouſand in ſecret.

The wolf is extirpated in theſe iſlands, formerly its abode. Inſects not leſs formidable and deſtructive are yet unſubdued. Our cattle, our fields

fields, our granaries, &c. often bear witneſs to this truth. The ſame ſpirit which made us maſters of the creation is ſtill neceſſary to preſerve the government. Our knowledge muſt keep pace with our deſires, and men in general will ſoon be compelled by neceſſity to the univerſal purſuit of a ſcience to which a philoſophic mind needs no ſuch incentive.

November 28, 1800.

XIII. *De-*

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XIII. *Deſcription of Brotera perſica and Muſtelia eupatoria, two new Plants cultivated in the Botanic Garden of Halle, by Curt Sprengel, M.D. Profeſſor of Botany in the Univerſity of Halle.*

Read March 3, 1801.

BROTERA PERSICA.

TAB. XII.

CLASSI XIV. adnumeranda.

Character eſſentialis genericus.

LABII inferioris lacinia media cucullata, involvens genitalia, eaque cum impetu protrudens.

DESCRIPTIO.—*Herba* quadripedalis, caule ramiſque tetragonis, axillis (fig. *a.*) barbatis.

Folia oppoſita, ſubſecunda, petiolata, ovata, ſerrata, ſcabriuſcula.

Inflorеſc. Cymata axillaris pedunculata. (fig. *b. b.*)

Cal. quinquefariſtatus, pubeſcens. (fig. *c. c.*)

Corolla minuta, calyce vix longior, ringens (fig. *d.*): labium ſuperius bipartitum: (1.) inferius tripartitum, lacinia media (3.) cucullata, antheras cum ſtylo occultans, donec externus ſtimulus accedat, qui ilico deprimit cucullum, ut antheræ erectæ prodeant

prodeant. Corolla pallida, luteſcit ad faucem cuculli: ipſe cucullus rufus eſt.

Stamina piloſa. *Antheræ* luteæ. (fig. *e.*)

Stylus violaceus. *Stigma* capitatum. (fig. *f.*)

Semina quatuor oblonga nuda in fundo calycis. (fig. *g.*)

In honorem ſummi botanici Felicis Avellar Brotero, Prof. Conimbricenſis, id genus dixi. Accepi autem ſemina ab amico *Thouino* e muſeo naturali Pariſino, quo apportata ſunt ab *Oliverio* et *Bruguerio* e Perſia.

MUSTELIA EUPATORIA.

TAB. XIII.

CLASSI XIX. adnumeranda.

Character eſſentialis genericus.

Anthodium ſimplex polyphyllum. *Rec.* nudum. *Papp.* duplex, paleaceus & quinquearistatus. *Corollulæ* quinquefidæ.

DESCRIPTIO.—*Herba* bipedalis: caule inclinato, recurvato.

Folia oppoſita, faſciculata, oblonga, apice denticulata, lucida, punctata, trinervia.

Inflor. in corymbis, quorum medius primo floret, lateralibus elongatis ſerius floreſcentibus.

Anthodium conſtanter quinquefloruin, polyphyllum, æquale. (fig. *a.*)

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Corollulæ quinquefidæ, quinæ. (fig. *b.*)

Stigmata longiſſima. (fig. *e. e.*)

Pappus duplex, paleaceus alter externus, internus alter quinque-ariſtatus. (fig. *e.*)

His potiſſimum notis abunde diſtinguitur ab Agerato et Eupatorio, cum quibus alioquin germanitatem quamdam naturalem habet.

Dixi in honorem eximii phytologi, *Muſtelii*, cujus *Eſſai ſur la Végétation* inſignia addidit incrementa doctrinæ de fabrica plantarum & de uſu partium.

XIV. *Obſervations on the Hinges of Britiſh Bivalve Shells.*

By Mr. William Wood, F.L.S.

Read January 6, 1801.

AMONG the many authors who have either noticed ſhells in their works on Natural Hiſtory, or have written profeſſedly on the ſubject, it is rather extraordinary that no particular attention ſhould have been hitherto paid to their hinges; more eſpecially as they afford the leading characters by which ſhells are arranged.

Da Coſta, indeed, in his *Elements of Conchology*, has figured the hinges of the ſeveral genera of bivalves; but many of them are not calculated to give a clear idea of the parts which they are intended to repreſent: beſides, he has confined himſelf to one ſpecies in a genus, which is by no means ſufficient, inaſmuch as many of the hinges of the ſame genus of ſhells differ materially from one another in their ſpecific characters.

Figures on this ſubject have been given alſo in the laſt volume of the *Amœnitates Academicæ*; but theſe are more calculated to miſlead than to inſtruct. The conſideration that ſomething of this kind, executed in a more accurate and comprehenſive manner than has hitherto been done, is ſtill a deſideratum among conchologiſts, has induced me to attempt the following obſervations, which I lay before the Society with all diffidence, conſcious that they are far from being faultleſs, and that ſome ſhells are omitted which may,

for any thing I know to the contrary, exhibit peculiarities in the formation of their hinges, not to be found in this paper. Perhaps what is already finiſhed may excite ſome more able member of this Society, whoſe cabinet is more extenſive, to complete the ſubject.

I am indebted to the accurate pencil of my friend Mr. Henry Boys for the *Solen pellucidus*, *Tellina bimaculata*, *Venus Chione*, and *Venus undata*. My acknowledgments muſt likewiſe be made to his moſt reſpectable father, William Boys, Eſq. for the ready acceſs which I have at all times had to his collection.

In the courſe of the following remarks, it will be noticed, that ſeveral ſhells are totally neglected, which are too common to be wanting even in a very confined collection. To account for this, it will be neceſſary to mention all the ſhells belonging to the Britiſh ſeries of bivalves which have not been inſerted, and to give a ſufficient reaſon for their omiſſion.

Of the genus *Mya*, all have been figured, except the *M. dubia* of Mr. Pennant, which at preſent I have not in my collection.

Of the *Solenes*, I have neither the *Legumen* nor *Cultellus*. But their loſs is of little conſequence, as the teeth of the former (according to Mr. Pennant) exactly reſemble thoſe of the *S. pellucidus*; whilſt the latter, having a ſingle tooth on both ſides of the hinge, will probably not differ materially from the *Vagina*. The hinge of the *S. Enſis* agrees exactly with that of the *Siliqua*.

Among the *Tellinæ*, the *T. fragilis* is unknown to me. The *T. trifaſciata*, *cornubienſis*, and *donacina*, are wanting, and the hinge of the *Fabula* is like the *planata*.

There is too great a ſimilarity in the hinges of the ſpecies belonging to the genus *Cardium*, to make more than one figure neceſſary.

Excepting the two lateral teeth of the *Mactra ſolida*, no eſſential

difference is to be perceived between the hinge of that ſhell and of the *M. lutraria*. I have therefore omitted it, in order that the number of figures might not be unneceſſarily increaſed.

Of the two ſpecies of *Donax*, deſcribed by Britiſh conchologiſts, the *Trunculus* only is in my poſſeſſion; but it is more than probable, from the reſemblance theſe two ſhells bear to each other, that their hinges are not very diſſimilar.

I have never ſeen the *Venus deflorata*, deſcribed and figured by Mr. Pennant in the *Britiſh Zoology*. The *V. ſinuoſa* and *ovata* are not among my ſhells; and the hinge of the *V. rotundata* is too like the *decuſſata* to need a deſcription. The hinge of the *V. borealis* will be found, upon compariſon, to reſemble exactly that of the *Mactra alba*; therefore it would be placed with more propriety in that genus. The *Donax Irus* ought at the ſame time to be removed into the third diviſion of the genus *Venus*, where the contour of the ſhell, as well as the formation of the hinge, will point out its proper ſituation.

In the genus *Arca*, it was thought unneceſſary to give a figure of the *lactea*, after exhibiting the ſtriking difference between the hinge of the *A. Nucleus* and *Glycymeris*.

Of the genus *Pecten*, *Oſtrea*, *Anomia*, and *Mytilus*, it is ſufficient to ſay, that a ſpecimen has been given from each, as the ſpecies are, for the moſt part, deſtitute of teeth, and the ſhells merely united by cartilage.

MYA.

truncata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3217. *Penn. Br. Zool. No.* 14. *t.* 41. *f.* 14. *Da Coſt. Br. Conch. p.* 233. *t.* 16. *f.* 1. 1.—*Elem. Conch. t.* 7. *f.* 16. *Liſt. Conch. t.* 428. *f.* 269.—*Hiſt. An. Ang. t.* 5. *f.* 36. *Gault. Teſt. t.* 91. *f. D. Chemn. Conch.* 6. *t.* 1. *f.* 1, 2.

TAB.

TAB. XIV. Fig. 1, 2.

A thick, broad, upright, ſtriated tooth in the upper valve*; in the lower valve, a deep, ſpoon-ſhaped hollow, with a ſmall tooth on one ſide, and a ſharp ridge on the other, running from the beak towards the truncated end.

Liſter, in his *Hiſtoria Animalium Angliæ*, has figured the lower valve of this ſhell, but has totally miſtaken the form of the tooth.

Da Coſta, in his *Britiſh Conchology*, and likewiſe in his *Elements*, has ſucceeded better, although his figures are by no means perfect.

arenaria. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3218. *Penn. Br. Zool. No.* 16. *t.* 42. *f.* 16. *Liſt. Conch. t.* 418. *f.* 262.—*Baſt. Opuſc. ſubſ.* 2. *p.* 69. *t.* 7. *f.* 2, 3. *Argenv. Zoom. t.* 5. *f.* 10.

TAB. XIV. Fig. 3, 4.

Hinge with an upright, fanſhaped tooth; on the ſide, a ridge deeply ſulcated; lower valve like the preceding, except the ſide tooth, which is ſcarcely to be diſtinguiſhed.

Mr. Pennant has given a very good figure of the tooth in the upper valve of this ſhell, and of the *M. truncata.*

* For the ſake of perſpicuity, in the deſcription of the Hinge, I have called that the upper valve which contains the great tooth.

margaritifera.

margaritifera. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3219. *Penn. Br. Zool. No.* 18. *t.* 43. *f.* 18. *Da Coſt. Conch. t.* 15. *f.* 15. *Liſt. Conch. t.* 149. *f.* 4.—*An. Ang. App.* 15. *t.* 1. *f.* 1. *Chemn. Conch.* 6. *t.* 1. *f.* 5. *Gault. Teſt. t.* 102. *f. C. Klein. Oſtr. t.* 10. *f.* 47. *Knorr. Vergn.* 4. *t.* 25. *f.* 2.

TAB. XIV. Fig. 5, 6.

The hinge of this ſhell is very thick and rugged; the tooth in the upper valve blunt, and uneven at the top. On one ſide there is a ſulcus, which receives a ſmall tooth from the oppoſite valve, at the ſame time that the large one fits into a correſponding depreſſion.

This, with the following ſhell, completes Da Coſta's genus of *Mya*. The two former he has placed among the *Chamæ*.

pictorum. *Linn. Syſt. Nat. ed. Gmel.* 3218. *Penn. Br. Zool. No.* 17. *t.* 43. *f.* 17. *Da Coſt. Br. Conch. p.* 228. *t.* 15. *f.* 4. 4. —*Elem. Conch. t.* 7. *f.* 12. *Liſt. Conch. t.* 147. *f.* 2, 3. —*An. Ang. t.* 2. *f.* 30. *App. t.* 1. *f.* 4. *Chemn. Conch.* 6. *t.* 1. *f.* 6. *Argenv. Conch. t.* 27. *f.* 10.—*Zoom. t.* 8. *f.* 11.

TAB. XIV. Fig. 7, 8.

In the hinge of the *M. pictorum* we meet with an arrangement of teeth different from any other of the Britiſh ſpecies of this genus.

Near the beak are ſituated two upright teeth, one in each valve. The largeſt of the two is ſerrated.—There are likewiſe three remote teeth, two in one ſhell,

ſhell, and one in the other. Both Da Coſta and Pennant have figured the inſide of this ſhell, without paying any attention to the teeth. Dr. Liſter, however, thought their arrangement too curious to be paſſed unnoticed. He has therefore engraved them in his *Hiſt. Conchyliorum*, and alſo in his *Hiſt. An. Ang.*

SOLEN.

Siliqua. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3223. *Penn. Br. Zool. No.* 20. *t.* 45. *f.* 20. *Da Coſt. Br. Conch. p.* 285. *t.* 17. *f.* 5.—*Elem. Conch. t.* 7. *f.* 8. *Liſt. Conch. t.* 409. *f.* 255.—*An. Ang. t.* 5. *f.* 37. *Chemn. Conch.* 6. *t.* 4. *f.* 29. *Gault. Teſt. t.* 95. *f. C. D. E. Knorr. Vergn.* 6. *t.* 1. *f.* 1.

TAB. XIV. Fig. 9.

The hinge of the *Solen Siliqua* is furniſhed with three teeth; two thick ones in one valve receiving a lamina between them from the other. An edged production from the teeth is continued down about the third of an inch on each ſide of the hinge, where it terminates inwards in a rounded ſhape.

Da Coſta, in his *Br. Conch.* has deſcribed the *Solen Siliqua*, but figured the *S. incurvatus* of Dr. Solander. Gmelin alſo has fallen into much the ſame error, by quoting Liſter, *Hiſt. Conch. t.* 413. A note of interrogation, indeed, is very properly added, but no reference is made to t. 409, f. 255, which is an exact copy of the true figure of the *S. Siliqua*, in the *Hiſt. An. Ang.*

The hinge in the two ſhells is the ſame.

Vagina.

Vagina. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3223. *Liſt. Conch. t.* 410. *f.* 256. *Argenv. Conch. t.* 24. *f. K. L. M. Zoom. t.* 6. *f. G. H. Knorr. Vergn.* 1. *t.* 28. *f.* 3.

TAB. XIV. Fig. 10.

Hinge with a ſingle tooth in each valve. A continuation of the inner edge of the ſhell forms the upper tooth. The lower one is fixed upon a baſe, which is ſituated obliquely.

The ſurface of both is flat.

pellucidus. *Penn. Br. Zool. No.* 23. *t.* 46. *f.* 23.

TAB. XIV. Fig. 11.

The hinge of this very delicate ſhell is furniſhed with five ſmall, pointed teeth, three of which are ſituated in one valve, and two in the other. It muſt be remarked, that the central one of the three is bifurcated.

This ſhell has hitherto, I believe, eſcaped the notice of every author, except Pennant; who informs us that it inhabits the Red Wharf, Angleſea. We find it, though very rarely, in the muddy part of the Sandwich ſhore, towards the mouth of the haven. A few ſpecimens have lately been dredged up at Folkſtone.

TELLINA.

planata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3232. *Penn. Br. Zool. No.* 29. *t.* 48. *f.* 29. *Liſt. Conch. t.* 405. *f.* 251. *Gault. Teſt. t.* 77. *f. M.*

TAB.

TAB. XV. Fig. 1—4.

One valve of the *T. planata* contains three teeth; two near the beak, and one rather remote.

The other valve has only two, and the largeſt is divided longitudinally.

incarnata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3234. *Penn. Br. Zool. No.* 32. *t.* 49. *f.* 32. 32. *Liſt. Conch. t.* 405. *f.* 250. —*An. Ang. t.* 4. *f.* 25. *Da Coſt. Br. Conch. p.* 211. *t.* 12. *f.* 4. 4. 4. *Gault. Teſt. t.* 88. *f. M.*

TAB. XV. Fig. 5—8.

This ſhell has two teeth cloſe to the beak in each valve, one of which is ſulcated. There are no remote teeth.

Mr. Pennant has called this ſhell *carnaria.* I believe his *T. incarnata* to be the *T. radiata* of Linnæus.

cornea. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3242. *Penn. Br. Zool. No.* 36. *t.* 49. *f.* 36. *Da Coſt. Br. Conch. p.* 173. *t.* 13. *fig.* 2. 2. *Liſt. Conch. t.* 159. *f.* 14.—*An. Ang. t.* 2. *f.* 31. *App.* 22. *t.* 1. *f.* 5. *Gault. Teſt. t.* 7. *f. B. C. Chemn. Conch.* 6. *t.* 13. *f.* 133. *a. b.*

TAB. XV. Fig. 9—12.

In the *T. cornea* we find four teeth in each valve. The two remotely ſituated are of a conſiderable ſize; but thoſe placed more immediately under the beak are ſo minute, that they are hardly to be diſtinguiſhed without a magnifying glaſs, even in the large Thames ſpecimens.

If the principal generic character of a ſhell reſt upon the formation of the hinge, it will, perhaps, be difficult to find a proper place for the *T. cornea*. The central teeth do not perfectly agree with the character of a *Tellina*; and the remote teeth differ ſo evidently, that Da Coſta has removed this ſhell into the next genus, where we find it under the name of *Cardium Nux*.

rivalis. *Maton in the Linn. Tranſ. v.* 3. *p.* 44. *t.* 13. *f.* 37, 38.

TAB. XV. Fig. 13—16.

The hinge of this ſhell is formed of four teeth in each valve, two at the beak and two remote. The two near the beak in one valve unite to form a ſmall arch. One of the teeth in the other valve is double.

T. rivalis is ably deſcribed, and well figured, in the Tranſactions of this Society, where the difference between it and the *T. cornea* is ſufficiently pointed out.

bimaculata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3240. *Da Coſt. Br. Conch. p.* 213. *Chemn. Conch.* 6. *t.* 13. *f.* 127.

TAB. XV. Fig. 17, 18, 19.

The figure of this ſhell was ſent to me, unaccompanied by a deſcription. There appears to be a thick tooth in the centre of the hinge of one valve; and a cavity, probably for its reception, between two teeth, in the oppoſite.

fervenſis.

ſervenſis. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3235. *Liſt. Conch. t.* 394. *f.* 241.

TAB. XV. Fig. 20, 21.

This hinge, in one valve, has a ſingle upright tooth, ſituated by the ſide of a ſlight depreſſion, which is divided in the middle by a ſmall ridge. The lower valve has likewiſe an erect tooth, which is notched.

The ſhape of this ſhell approaches ſo nearly to the *T. radiata*, that I imagine the hinge in both will be found the ſame. At preſent I have not an opportunity of comparing them.

CARDIUM.

aculeatum. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3247. *Penn. Br. Zool. No.* 37. *t.* 50. *f.* 37. *Da Coſt. Elem. of Conch. t.* 1. *f.* 8. *Liſt. Conch. t.* 321. *f.* 128. *Gault. Teſt. t.* 72. *f. A. Chemn. Conch.* 6. *t.* 15. *f.* 155—157.

TAB. XVI. Fig. 1, 2.

The character of the hinge in this ſhell is ſo ſtrongly marked, and ſo exactly reſembles the other ſpecies, that one figure will ſuffice for the whole genus.

No other deſcription is neceſſary than what may be found in the explanation of the plates.

MACTRA.

lutraria. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3259. *Penn. Br. Zool. No.* 44. *t.* 52. *f.* 44. *Liſt. Conch. t.* 415. *f.* 259.—*An. Ang. t.* 4. *f.* 19. *Rumph. Muſ. t.* 45. *f. M. Chemn. Conch.* 6. *t.* 24. *f.* 240, 241.

TAB. XVI. Fig. 3, 4.

The valves of this ſhell are firmly connected together, by a quantity of cartilage ſeated in two ſpoon-ſhaped cavities. On the ſide of one of the cavities, in the upper valve, there is a very ſtrong tooth, the two plates of which form an obtuſe angle, and the whole is received between two teeth in the oppoſite valve.

Da Coſta, when he wrote his *Britiſh Conchology*, was not aware that this ſhell formed a diſtinct ſpecies from the following; he has therefore deſcribed and figured the *M. hians* α under the name of *Chama magna*, while his Synonyms direct the reader to the *M. lutraria*.

hians. *Da Coſt. Br. Conch. p.* 231. *t.* 17. *f.* 4.

TAB. XVI. Fig. 5, 6.

The great cavity in the hinge of this ſpecies is larger, more ſpread, but not ſo regularly ſhaped as in the preceding. The great tooth in the upper valve locks, like that in the *M. lutraria*, between two teeth in the lower valve, of which the outer one, in the ſpecimen before me, is grooved longitudinally, and, when the ſhell is cloſed, fits into a ſmall cavity on the outſide of the tooth in the upper valve. It ſhould likewiſe be noted, that there is in both valves a deep, narrow ſulcus, which runs from the beak of the ſhell acroſs the baſe of the great cavity, and cloſe on the inſide of the teeth.

ſultorum.

ſtultorum. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3258. *Penn. Br. Zool. No.* 30. *t.* 49. *f.* 30. *Da Coſt. Br. Conch. p.* 196. *t.* 12. *f.* 3. 3. *Liſt. Conch. t.* 251. *f.* 85. *Gault. Teſt. t.* 71. *f. C. Chemn. Conch.* 6. *t.* 23. *f.* 224—227.

TAB. XVI. Fig. 7, 8.

There is an erect tooth in the upper valve of this ſhell, near the beak, ſomewhat ſimilar in ſhape to the great one in the *M. lutraria.* This fits within a rectangular tooth in the lower valve, which likewiſe contains four remote teeth, like laminæ, receiving between them two from the upper valve.

I have referred for this ſhell to Mr. Pennant's *Tellina radiata*, as both his deſcription and figure agree exactly with the Linnean *M. ſtultorum.* His ſhell of that name (*No.* 42. *t.* 52. *f.* 42.) is, perhaps, only a young one of the *M. ſolida.*

alba. TAB. XVI. Fig. 9—12.

I believe we are indebted for the diſcovery of this ſhell to that accurate conchologiſt, William Boys, Eſq. who found it on the Sandwich ſhore, where I have ſince met with it in abundance.

The hinge has the true ſpoon-ſhaped cavity peculiar to the genus *Mactra*, with a ſmall tooth ſituated cloſe to it in the upper valve, which has no remote teeth. The lower valve is provided with two.

DONAX.

trunculus. *Lynn. Syſt. Nat. ed. Gmel.* 1. *p.* 3263. *Penn. Br. Zool. No.* 45. *t.* 55. *f.* 45. *Da Coſt. Br. Conch. p.* 207. *t.* 14.

t. 14. *fig.* 3. *Liſt. Conch. t.* 376. *f.* 217.—*An. Ang. t.* 5. *f.* 35. *Borlaſe Cornw. p.* 278. *t.* 28. *f.* 25. *Chemn. Conch.* 6. *t.* 26. *f.* 253, 254.

TAB. XVI. Fig. 13—16.

Hinge with a thick furrowed tooth in one valve, received between two others in the oppoſite. A ſingle marginal tooth in each valve, at a little diſtance from the beak.

VENUS.

iſlandica. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3271. *Penn. Br. Zool. No.* 47. *t.* 53. *f.* 47. *Da Coſt. Br. Conch. p.* 183. *t.* 14. *f.* 5. *Liſt. Conch. t.* 272. *f.* 108.—*An. Ang. t.* 4. *f.* 22. *Gault. Teſt. t.* 85. *f. B. Chemn. Conch.* 6. *t.* 32. *f.* 341.

TAB. XVII. Fig. 1, 2.

There is a thick upright tooth under the beak in one valve of this ſhell, which locks between two others in the oppoſite valve.

For the other teeth with which this ſhell is provided, ſee the Explanation of the Plates.

Chione. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3272. *Da Coſt. Br. Conch. p.* 184. *t.* 14. *f.* 7. *Gault. t.* 86. *f. A.*

TAB. XVII. Fig. 3, 4.

A ſtrong thick tooth is ſeated in each valve, directly under the cordiform depreſſion of the ſhell; another cloſe to the beak, and a third diverging from it, which laſt is thin, and in one valve grooved.

verrucoſa. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3269. *Penn. Br. Zool. n.* 48. *t.* 54. *f.* 48. *Da Coſt. Conch. p.* 185. *t.* 12. *f.* 1. 1. *Liſt. Conch. t.* 284. *f.* 122. *Gault. Teſt. t.* 75. *f. H. Borlaſe Cornw. p.* 278. *t.* 28. *f.* 32.

TAB. XVII. Fig. 5, 6.

This hinge is ſet with two ſtrong erect teeth, near the beak, in each valve, beſides another which runs in the direction of the cartilage.

Gallina. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3270. *Da Coſt. Br. Conch. p.* 191. *t.* 12. *f.* 2. 2. *Liſt. Conch. t.* 282. *f.* 120. *t.* 295. *f.* 131. *Knorr. vergn.* 5. *t.* 14. *f.* 2—5. *Chemn. Conch.* 6. *t.* 30, *f.* 308, 310.

TAB. XVII. Fig. 7, 8.

One valve is furniſhed with three teeth, the middle one thick and triangular, broad at the baſe, and the upper angle ſeated directly under the beak of the ſhell. Of the two other teeth, one is plate-like, and runs in the direction of the cordiform depreſſion, whilſt the other, much thicker, paſſes from the beak towards the cartilage. The other valve differs in having a middle tooth leſs triangular, and ſituated obliquely. In the room of the plate-like tooth there is one much more ſubſtantial.

exoleta. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3284. *Penn. Br. Zool. No.* 49. *t.* 54. *f.* 49. *A. t.* 56. *f.* 49. *Da Coſt. Br. Conch. p.* 187. *t.* 12. *f.* 5. 5. *Liſt. Conch t.* 292. *f.* 128. *Gault. Teſt. t.* 75. *f. F. Chemn. Conch. t.* 38. *f.* 402. 404.

TAB.

TAB. XVII. Fig. 9, 10.

The *Venus exoleta* is provided with three large teeth in each valve, one of which is double. This ſhell has the rudiment of a ſmall tooth ſeated at the baſe of one of the largeſt, on the ſide next the cordiform depreſſion, and in the valve oppoſite to that which contains the lateral double tooth.

decuſſata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3294. *Da Coſt. Br. Conch. p.* 202. *t.* 14. *f.* 4. 4. *Liſt. Conch. t.* 423. *f.* 271. *Gault. Teſt. t.* 85. *f. L.*

TAB. XVII. Fig. 11, 12.

This ſhell has two grooved teeth in one valve, beſides a plain one. Theſe teeth receive another between them, from the oppoſite valve, which is likewiſe grooved, and has for its companions a ſmall plain tooth on one ſide, and the appearance of a tooth on the other. Young ſhells have three teeth in each valve. The intermediate one is conſtantly cleft, the others plain; at leaſt, in all the ſpecimens which I have met with.

craſſa. *Linn. Syſt. Nat. ed. Gmel* 1. *p.* 3288. *Penn. Br. Zool. No.* 28. *t.* 48. *f.* 28. *Da Coſt. Br. Conch. p.* 194. *t.* 13. *f.* 4. *right hand. Liſt. Conch. t.* 299. *f.* 136.

TAB. XVII. Fig. 15, 16.

Although we have high authority for placing this ſhell among the *Veneres*, yet we find it in the Britiſh Zoology ranked among the *Tellinæ*; and, indeed,

if we are to judge by compariſon, it more properly belongs to that genus.

The hinge of the *V. craſſa* is very plain and ſimple, conſiſting of a grooved central tooth and two others, which are remote. One valve, however, has hardly the appearance of remote teeth, though the central tooth in both is equally ſtrong.

undata. *Penn. Br. Zool. No.* 51. *t.* 55. *f.* 51.

TAB. XVII. Fig. 17, 18.

The hinge of the *V. undata* has a ſmall central tooth ſituated under the beak of the ſhell, which fits into a triangular cavity in the oppoſite valve. A deep ſulcus runs from the beak in the direction of the cartilage ſlope.

ARCA.

Glycymeris. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3313. *Penn. Br. Zool. No.* 58. *t.* 58. *f.* 58. *Da Coſt. Br. Conch. p.* 168. *t.* 11. *f.* 2. 2. *Liſt. Conch. t.* 278. *f.* 82. *Chemn. Conch.* 7. *t.* 57. *f.* 564.

TAB. XVIII. Fig. 1, 2.

" The hinge of the *Arca Glycymeris* is ſemicircular, and on each ſide ſet with a curved row of ſtrong tranſverſe teeth, generally from five to ten on each ſide."

This is Da Coſta's deſcription, and is ſo far juſt; but he tells us that the centre of the hinge is quite

ſmooth, and without teeth. This his figure contradicts, as well as two ſpecimens in my cabinet, the teeth of which meet in the centre, though their ſize is very much reduced. The drawing which I have given is from one of them.

Nucleus. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3314. *Da Coſt. Br. Conch. p.* 170. *t.* 15. *f.* 6. *right hand. Gault. Teſt. t.* 88. *f. R. Chemn. Conch.* 7. *t.* 58. *f.* 574. *a. b.*

TAB. XVIII. Fig. 3—6.

The beautiful arrangement of teeth in the hinge of this ſhell is not to be equalled by any other ſpecies on our ſhores. The regularity of their order and the elegance of their form make an accurate figure particularly deſirable. This I have attempted to give, to the beſt of my abilities, in a magnified repreſentation.

The hinge is to be ſeen in all its beauty only in live ſhells.

Of the remaining genera little need be ſaid, as the hinges are, for the moſt part, without teeth. I have, therefore, only figured one ſpecies of each genus, which, I preſume, will be thought ſufficient.

PECTEN.

pictus. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3325. *(oſtrea opercularis.) Da Coſt. Br. Conch. p.* 144. *t.* 9. *f.* 1, 2. 4, 5.

TAB.

TAB. XVIII. Fig. 7, 8.

" Hinge toothleſs, being only a trigonal cavity in the very centre of the commiſſure or ſummit of the ſhell, which runs in a ſtraight horizontal line." *Da Coſt. Br. Conch. p.* 140.

OSTREA.

edulis. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3334. *Liſt. Conch. t.* 194. *f.* 31.

TAB. XVIII. Fig. 9, 10.

The ſhells of this genus are connected together by a ſtrong central cartilage. There is a variety with a rugoſe appearance on each ſide of the hinge, which is very well repreſented in Dr. Liſter's figure.

ANOMIA.

Ephippium. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3240. *Penn. Br. Zool. No.* 70. *t.* 62. *f.* 70. *Da Coſt. Br. Conch. p.* 165. *t.* 11. *f.* 3. *Liſt. Conch. t.* 204. *f.* 38.

TAB. XVIII. Fig. 11, 12.

A ſimple cartilaginous hinge with an oval cavity in the concave valve. Da Coſta mentions a claw in the other valve, which is not in my ſpecimen.

MYTILUS.

edulis. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3353. *Penn. Br. Zool. No.* 73. *t.* 63. *f.* 73. *Da Coſt. Br. Conch. p.* 216. *t.* 15. *f.* 5. *left hand.*

TAB. XVIII. Fig. 13, 14.

I believe it has not hitherto been publicly noticed, that the common muſcle poſſeſſes teeth; ſuch, however, is the caſe, and their ſituation, cloſe to the beak of the ſhell, was firſt pointed out to me by Mr. Boys.

Theſe teeth are by no means regular, either in their arrangement or ſhape; nor is every ſhell provided with them. The ſpecimens in which I have found them are of a much larger ſize than the common, and generally make their appearance in the London markets in the depth of winter; but I am told they are not ſo much eſteemed as the ſmaller ones.

The teeth are from three to ſeven in number, and, when examined collectively, reſemble in figure and irregularity the knobs of a lobſter's claw.

PINNA.

muricata. *Linn. Syſt. Nat. ed. Gmel.* 1. *p.* 3364.

The two valves of the *Pinna* are merely united by a thin membrane, which forms a hinge of the moſt ſimple conſtruction, without even the veſtige of a tooth.

EXPLANATION OF THE PLATES.

TAB. XIV.

Fig. 1, 2. The hinge of the *Mya truncata.* (a) The great tooth. (b) The

(b) The correſponding depreſſion. (c) A ſmall tooth on one ſide of it.

Fig. 3, 4. The hinge of the *Mya arenaria.* (a) The great tooth. (b) A ridge grooved longitudinally. (c) A ſmall curve in the margin. (d) The cavity for the reception of the tooth.

5, 6. The hinge of the *Mya margaritifera.* (a) The rugged tooth. (b) Its cavity. (c) A ſharp ridge on one ſide of it, which paſſes into the cavity (d).

7. The hinge of the *Mya pictorum.* (a. a) The indented teeth. (b. b) The remote teeth.

8. A ſide view of one valve of the ſame.

9. The hinge of the *Solen Siliqua.*

10. The hinge of the *S. Vagina.*

11. *S. pellucidus.* (a) The bifurcated tooth. (b.b) The two other teeth in the ſame valve. (c) The two oppoſite teeth.

Tab. XV.

1, 2. The hinge of the *Tellina planata.*

3, 4. The ſame magnified*. (a. a) The large tooth in each valve. (b.b) Two ſmall teeth. (c) The lateral tooth.

5, 6. The hinge of the *Tellina incarnata.*

7, 8. The ſame magnified. (a.a) The two large teeth. (b.b) The two ſmaller ones. When the ſhell is placed horizontally theſe teeth appear very prominent, and the ſulcus in the large tooth is very apparent.

9, 10. The hinge of the *Tellina cornea.*

* The ſhells were, for the moſt part, magnified by Ellis's ſingle Aquatic Microſcope.

Fig.

Fig. 11, 12. The ſame magnified. (a.b) Two teeth which receive between them the triangular tooth (c). (d) A ſmall tooth which paſſes on the outſide of (a). (e. e. e. e) Lateral teeth.

13, 14, The hinge of the *Tellina rivalis.*

15, 16. The ſame magnified. (a.b) Two teeth which unite, and are continued to form an arch for the reception of the triangular tooth (c), on one ſide of which is a ſmall tooth (d). (e. e. e. e) Lateral teeth.

17,18,19. Hinge of the *Tellina bimaculata.*

20, 21. *Tellina fervenſis.* (a.b) Two erect teeth. In my ſpecimen, one is plain, the other notched. (c) A ſmall ridge dividing a depreſſion by the ſide of (a).

TAB. XVI.

1, 2. *Cardium aculeatum.* (a. a. b. b) Four erect teeth which lock together when the ſhell is cloſed. (c) A remote tooth which fits between (d. e), while (f) receives its oppoſite, (g).

3, 4. *Mactra lutraria.* (a) The great tooth. (b) The ſpoon-ſhaped cavity. (c) The place which receives the great tooth.

5, 6. *Mactra hians.* (a) The erect tooth. (b.b) The great cavity. (c. d) Two teeth which receive (a) between them. (e) A ſmall cavity for the grooved tooth (d). (f.f) A narrow ſulcus.

7, 8. *Mactra ſtultorum.* (a) The triangular tooth. (b) The rectangular one in the oppoſite valve. (c. c) The cavity for the cartilage. (d. d. d. d) Remote teeth.

9, 10. *Mactra alba* of the natural ſize.

11, 12. The hinge of the ſame magnified. (a. a) The ſpoon-ſhaped cavity. (b) A ſmall tooth. (c.c) Remote teeth.

Fig.

Fig. 13, 14. The hinge of the *Donax Trunculus.*

15, 16. The ſame magnified. (a) A thick ſulcated tooth received, when the ſhell cloſes, between (b. b). (c. c) Marginal teeth.

Tab. XVII.

1, 2. *Venus iſlandica.* (a) The great tooth which locks between (b. b), while the rugged tooth (c) fits into a hollow within the ſmall tooth (d). (e. e. e) Remote teeth.

3, 4. *Venus Chione.* Beſides the two ſtrong teeth in this ſhell, (a) and (b), there is a third, (c), which paſſes into the cavity (d). (e) A tooth grooved longitudinally.

5, 6. *Venus verrucoſa.* (a. b) Two thick teeth receiving (c) between them. (d) A large tooth which paſſes on the inſide of (e). (f) A thin tooth in the direction of the cartilage.

7, 8. *Venus Gallina.* (a.b) The two principal teeth. (c.d) Two ſmaller ones, of which (d) is plate-like. (e) A marginal tooth.

9, 10. *Venus exoleta.* (a) An erect tooth which locks between (b. b). (c) A thick channelled tooth received between (d. d).

11, 12. *Venus decuſſata.* (a) The two cleft teeth in one valve. (b) The ſame in the oppoſite. (c) The plain tooth.

13, 14. This ſhell is provided with a beautiful pectinated hinge, conſiſting of three teeth in each valve. Theſe teeth are placed in the moſt regular order, and the middle one, I believe, is conſtantly grooved. Frequently there is a channel in one of the other teeth, and ſometimes, though rarely, we meet with it in both.

When this ſpecies is found with only two teeth in one

valve and three in the other (as is ſometimes the caſe), it muſt be conſidered as incomplete.

It was not till I began attentively to examine the hinges of Britiſh bivalves, that this ſhell appeared to me eſſentially different from the *V. decuſſata*. We find it, not uncommonly, on the Sandwich ſhore, from half an inch to one and a half or two inches in breadth, and ſometimes marked on the outſide (in a zigzag manner) with all the ſtrength and elegance of a foreign ſpecimen.

This ſpecies is broader, in proportion, than the *V. decuſſata*, and the ſtriæ are more delicate.

Fig. 15, 16. *Venus craſſa.* (a) The two principal teeth. (b.b.b.b) Remote teeth.

17, 18. The hinge of the *Venus undata.* (a) The central tooth. (b) Its cavity.

TAB. XVIII.

1, 2. The hinge of the *Arca Glycymeris*, which in this particular ſpecimen is furniſhed with an extraordinary number of teeth.

3, 4. *Arca Nucleus* of the natural ſize.

5, 6. The hinge of the ſame magnified.

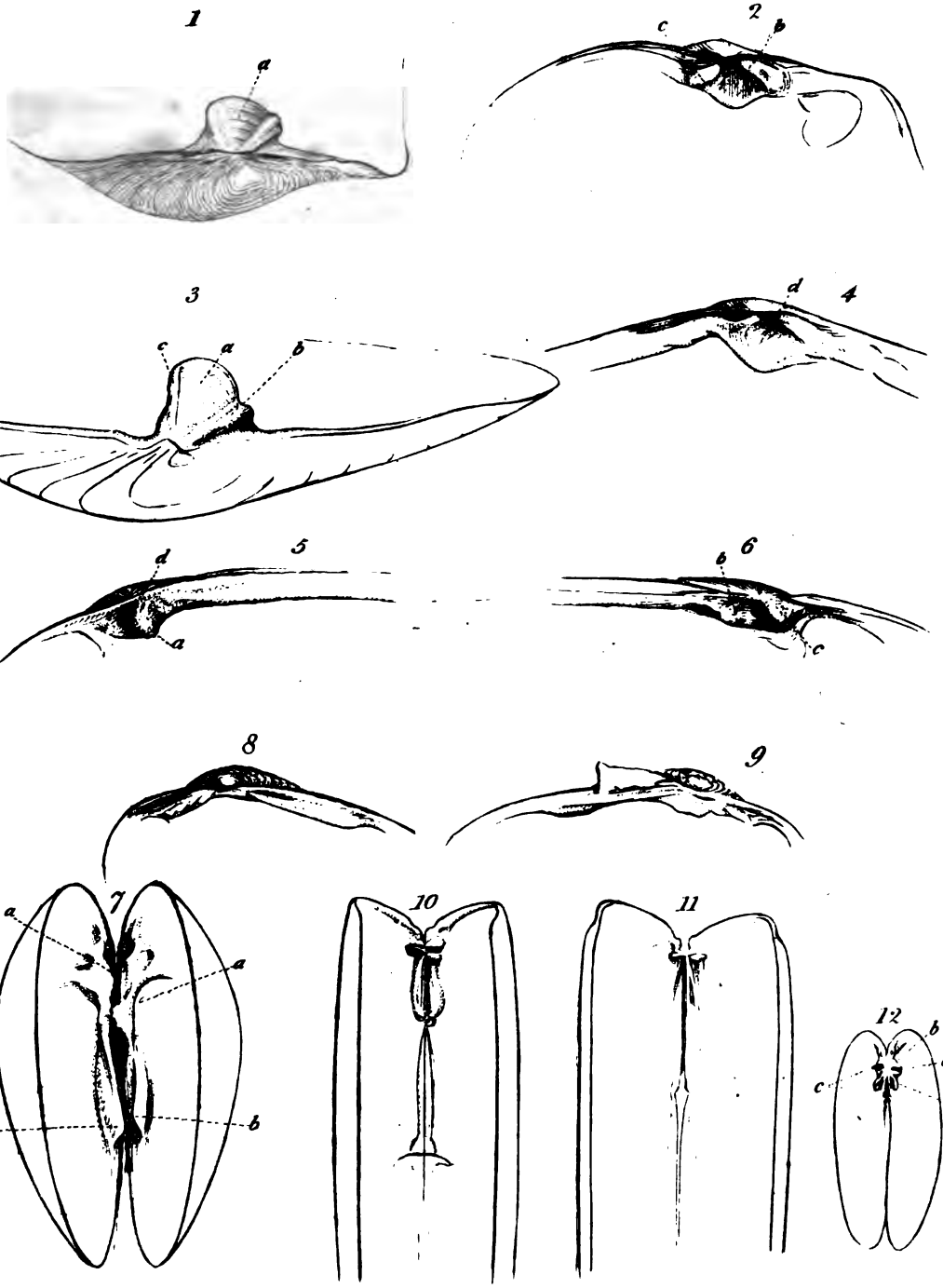
7, 8. The hinge of the *Pecten pictus.*

9, 10. The hinge of the *Oſtrea edulis.*

11, 12. The hinge of the *Anomia Ephippium.*

13, 14. The hinge of the *Mytilus edulis.* (a. a) The ſituation of the teeth.

XV. *Cata-*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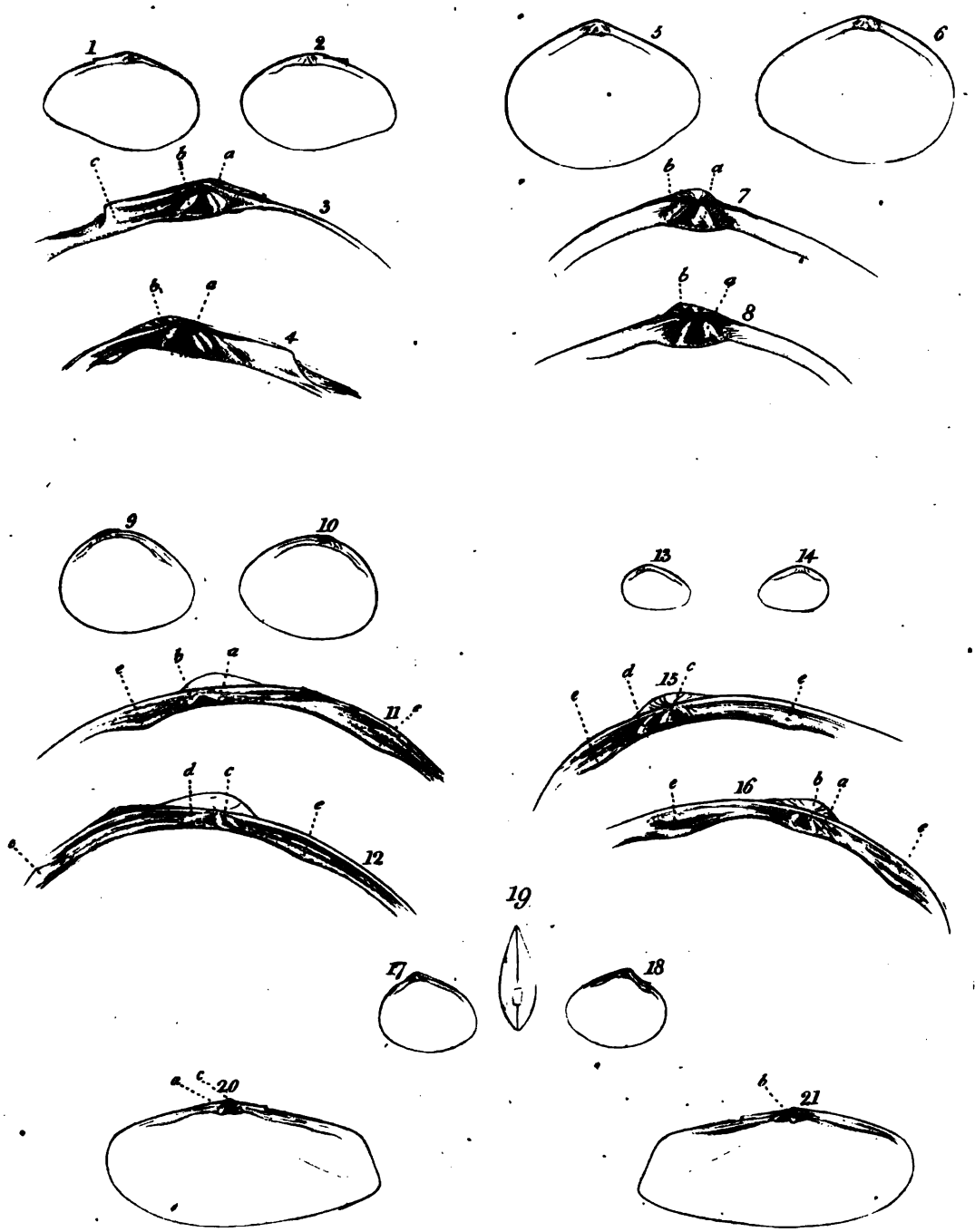
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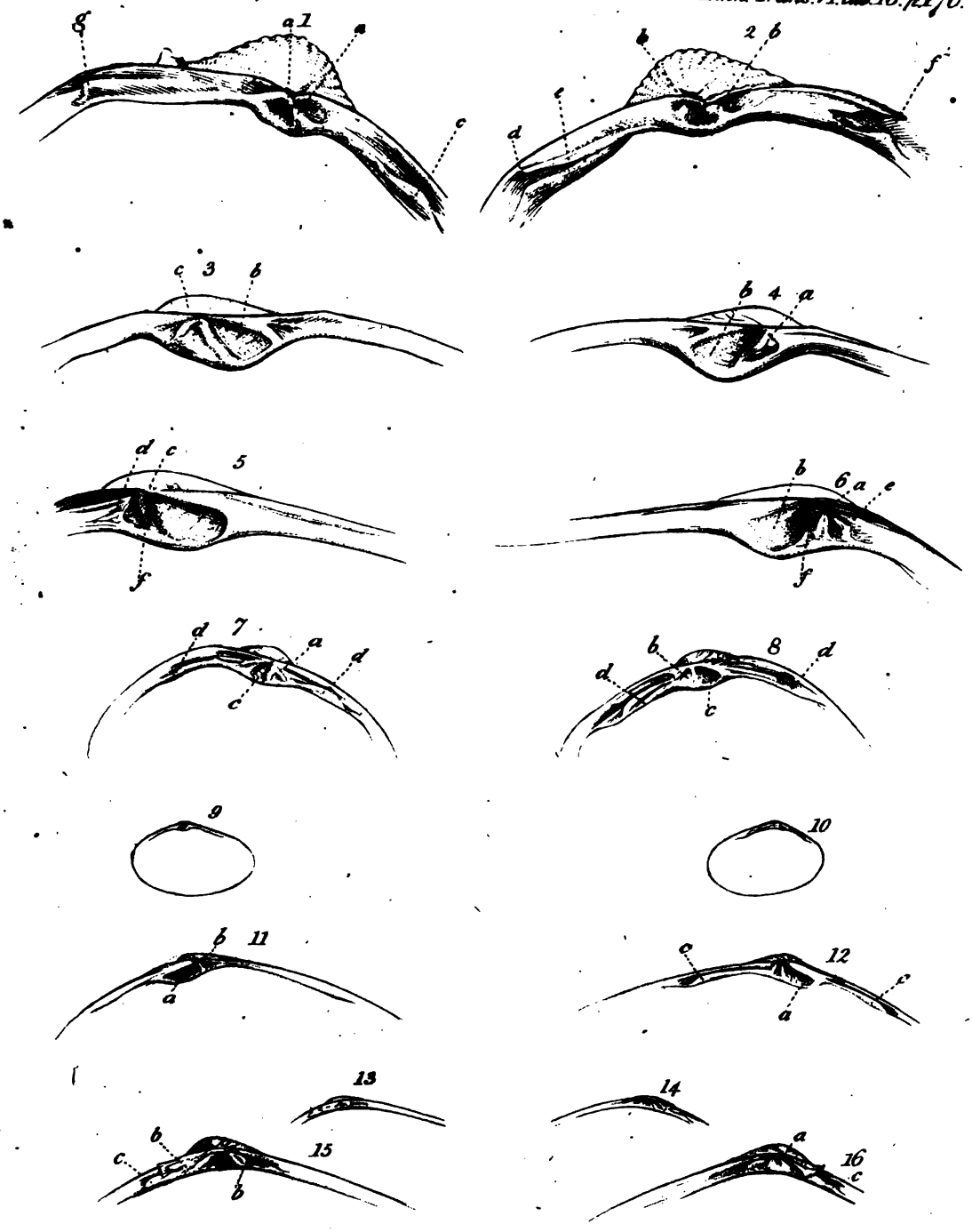
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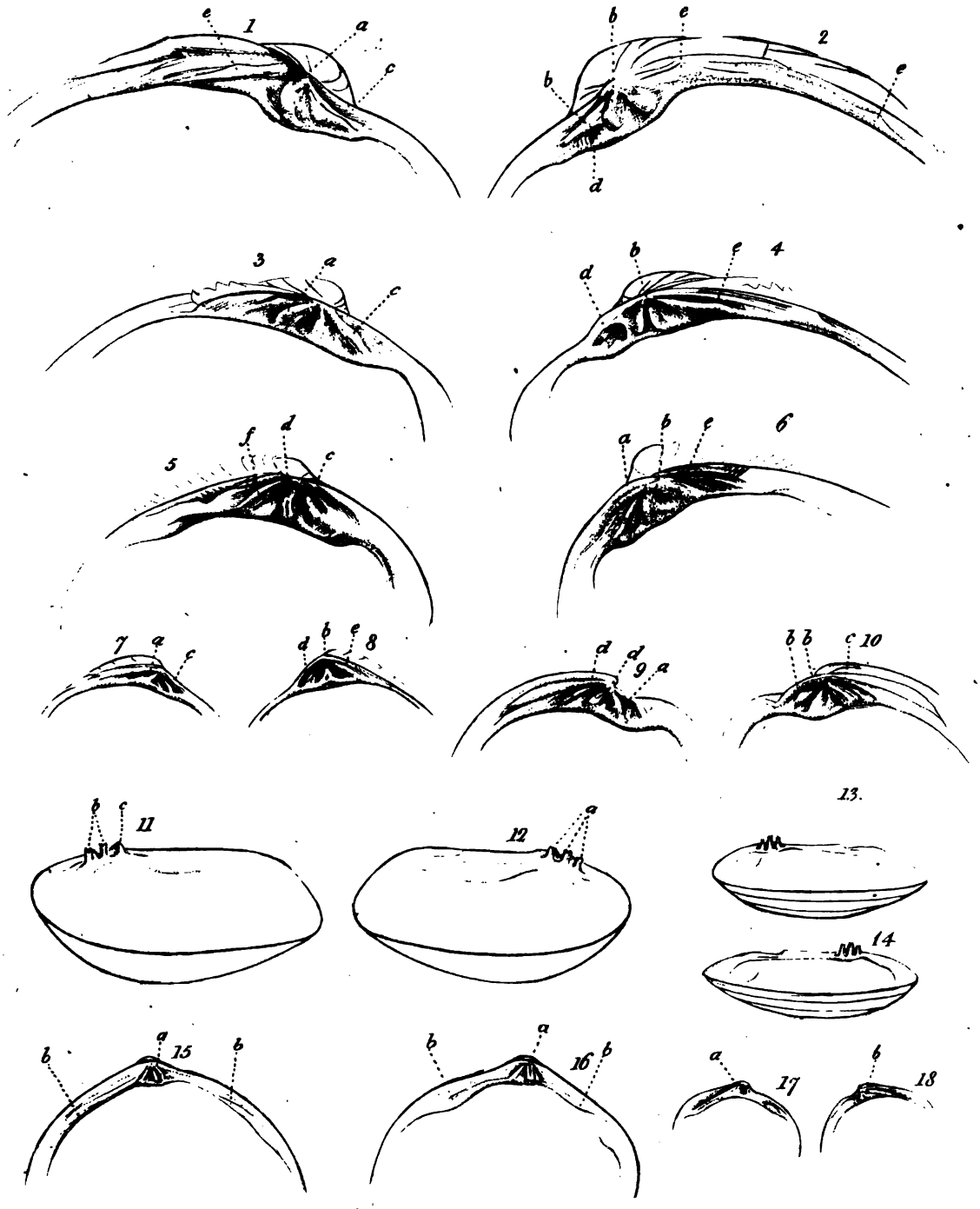
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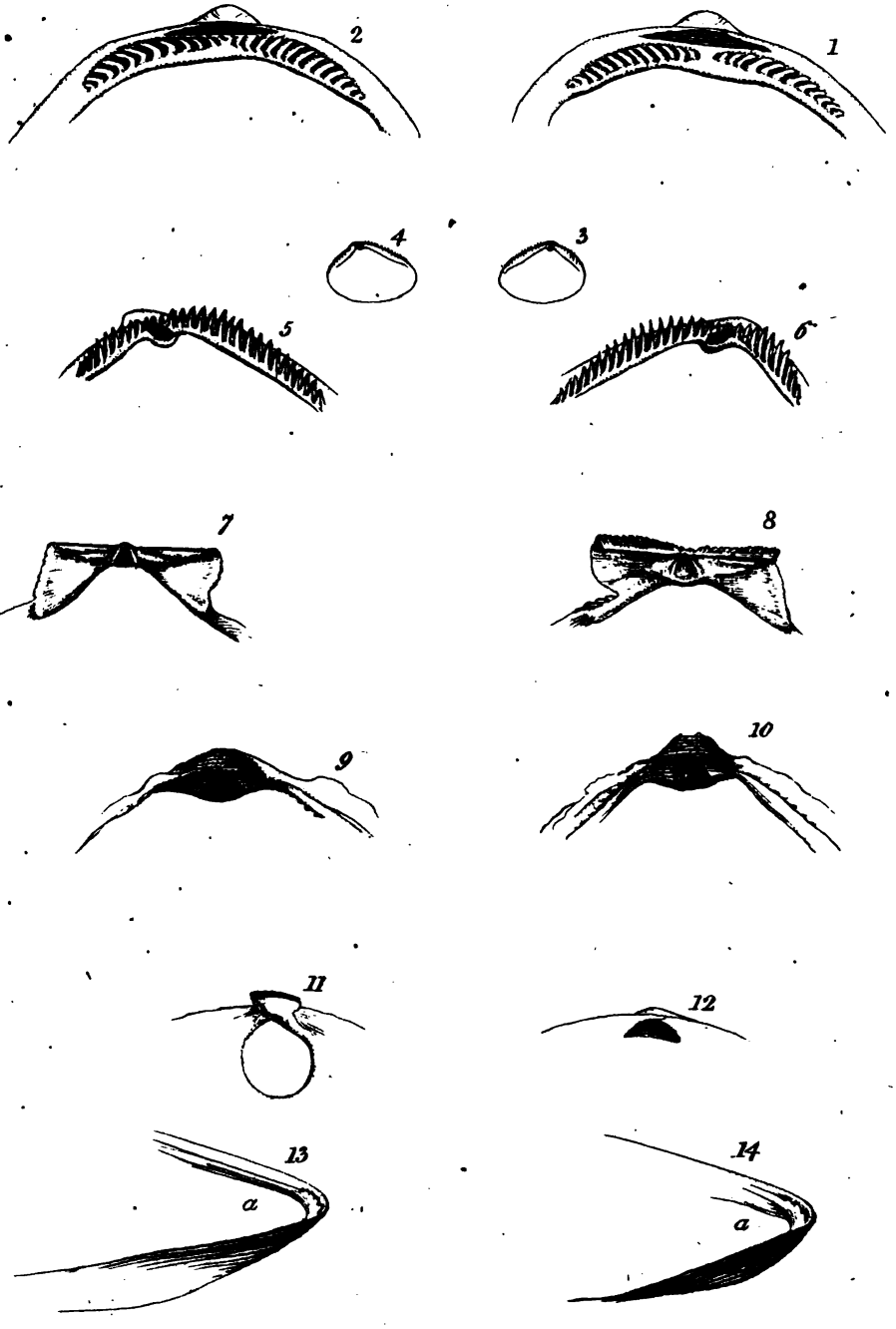
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XV. *Catalogue of the more rare Plants found in the Environs of Dover, with occaſional Remarks. By Mr. Lewis Weſton Dillwyn, F.L.S.*

Read March 3, 1801.

HAVING ſpent a conſiderable proportion of the laſt three years at Dover, and preſerved a liſt of the plants which I found in its neighbourhood, I ſubmit to the Linnean Society the following ſelection of thoſe which, from their ſcarcity or any other circumſtance, more particularly attracted my attention. I flatter myſelf it will not be unacceptable to ſuch botaniſts as may viſit that part of the kingdom, and that it may alſo ſerve in ſome meaſure to correct the habitats, given in ſome reſpectable works, of a few plants which, if not now extinct in the places aſſigned to them, have at leaſt eluded a diligent ſearch on my part.

Higham Lodge, Feb. 16, 1801.

Salicornia herbacea, with *Aſter Tripolium*, *Eryngium maritimum*, and moſt of the more common ſea-ſhore plants, in or about Sandwich ſalt marſhes.

Veronica montana. In moſt of the woods about Dover.

Valeriana rubra. On old walls of the Elms, where it has propagated itſelf for time immemorial, but is probably of garden origin.

Iris fœtidiſſima. On the road from Dover to Folkſtone, about half a mile from Archcliff Fort, and in many other places in the neighbourhood.

Schænus Mariſcus. In Ham Ponds near Eaſtry.

——— *compreſſus.* In boggy ground at Cockſhill, and about Ham Ponds.

Scirpus pauciflorus. About Ham Ponds.

Phalaris arenaria. On the ſandy ſhores of Deal, Sandwich, and Dimchurch.

Aira criſtata. On Sandwich Flats.

Poa diſtans. On Sandwich Flats and about Lidden-ſpout, near Dover.

— *bulboſa.* Among the ſand-hills between Deal and Sandwich.

Arundo colorata, foliis variegatis ſtriatis. In a ditch in Romney marſh near Dimchurch.

Rotbollia incurvata. On the ſhore a little north of Sandown Caſtle, and near Lidden-ſpout.

Triticum loliaceum. About Sandwich Salt-pans.

Aſperula cynanchica. Common on the hills about Dover.

Rubia peregrina. On the cliffs eaſt of the Caves, and in Langdon-bay.

Borago officinalis, floribus albis. At the entrance into Sandwich from Deal, and about Lymne Caſtle.

Convolvulus Soldanella. About Deal and Sandwich, plentifully.

Verbaſcum nigrum. On the ſides of the London road on Lidden-hill, about four miles from Dover.

Vinca minor. In great abundance in the lane about half a mile weſt of the Elms.

—— *major.* In the lane adjoining Eaſt Langdon church; near Eyethorne, and in the lanes at the back of Hythe.

Gentiana Amarella. Plentiful on the Dover hills.

Bupleurum tenuiſſimum. W. Boys, Eſq. F.L.S. informs me that Hudſon found this on the bank of the river, about half a mile N.E. of Sandwich; but I looked for it there in vain.

Crithmum maritimum. On the cliffs about Dover.

Oenanthe

Oenanthe pimpinelloides. Ditches in Sandwich and Romney marſhes.

Smyrnium Oluſatrum. Common in the neighbourhood of Dover.

Narciſſus poeticus. Found near Hougham, by the Rev. J. Lyon, F.L.S. to whom I am much obliged for the aſſiſtance he gave me in my botanical reſearches.

Juncus maritimus. Near Dimchurch on the road to Romney.

Frankenia lævis. On the cliffs about Archcliff Fort.

Aliſma Damaſonium. In a pool under the cliff between Folkſtone and Sandgate, ſparingly.

—— *ranunculoides.* Ditches between Ham Ponds and Eaſtry, and in the boggy grounds about Wingham.

Epilobium anguſtifolium. In the woods about half a mile weſt of River Poorhouſe.

Chlora perfoliata. Common in the neighbourhood of Dover.

Paris quadrifolia. In the orchard at the Elms, and in moſt of the woods about Dover; often with 5, 6, or 7 leaves.

Dianthus Caryophyllus. Not 'on Sandown,' and very ſparingly 'on Deal Caſtle.'

Silene nutans. On the cliffs about Dover, abundantly, and on Sandgate Caſtle. *S. paradoxa* is not, I believe, to be found in the neighbourhood.

—— *maritima.* On the beach between Sandgate and Hythe, where I have found ſome plants with ripe ſeed in the middle of June, and ſome in full flower in the beginning of November.

—— *conica.* Common on the range of ſand-hills beginning at Deal and running eaſtward of Sandwich; and on the ſand-hills directly 'oppoſite the Warren-houſe at New Romney' ſparingly.

Arenaria marina. Common at the Caves, &c. The ſeeds are roughiſh. Seldom more than one in ten of thoſe in each capſule are furniſhed with a margin, which is broad, membranaceous, white,

white, and ſtriated; and I never obſerved the rudiment of one in more than half the other ſeeds.

Sedum anglicum. About Sandown Caſtle, and on the beach about two thirds of the way from Dover to Folkſtone.

Lychnis dioica, floribus albis pleniſſimis. On the ſides of the north end of the Old Haven at Sandwich.

Euphorbia paralias. Under the South Foreland, and in great abundance a little weſtward of Shakeſpear's Cliff.

Papaver hybridum. Edge of the cliff near Archcliff Fort.

——— *Argemone* β. Near Sandown Caſtle.

Aquilegia vulgaris. About the ruins of Raddigund's Abbey.

Ranunculus Lingua. In the Old Haven at Sandwich, and in and about Ham Ponds.

Antirrhinum ſpurium. Corn-fields near Ramſgate, on the road to Margate.

——— *majus.* On old walls, but not 'on the cliffs of Dover.'

Digitalis purpurea. On the beach near Hythe, and in large quantities on the beach near Dungeneſs Light-houſe.

Orobanche ramoſa. Found by the Rev. J. Lyon near Hougham.

Crambe maritima. In St. Margaret's and Langdon bays; and very plentifully on the beach, about half way from Dover to Folkſtone.

Braſſica Oleracea. About the Caves and Shakeſpear's Cliff.

Erodium maritimum. Found by my friend, Joſeph Woods, jun. and myſelf on the walls of Sandgate Caſtle.

Geranium lucidum. On the beach about half way between Dover and Folkſtone; and about the ruins of Lymne and Saltwood Caſtles, near Hythe.

——— *columbinum.* On the hills about Dover, ſparingly.

Malva moſchata, floribus albis. In fields near Eyethorne.

Piſum maritimum. On the beach between Walmer Caſtle and Kingſdown.

Lathyrus Niſſolia. About the 65th mile ſtone on the ſides of the London road.

——— *ſylveſtris.* In the dark lane ſouth of the main entrance into Walderſhare Park.

Hippocrepis comoſa. Common on the hills about Dover.

Trifolium ornithopodioides.
——— *ſubterraneum.*
——— *ſcabrum.*
} Between Dimchurch and New Romney.

Trifolium maritimum. In Sandwich ſalt marſhes.

——— *glomeratum.*
Medicago polymorpha β.
} Near Sandown Caſtle.

Hypericum androſæmum. In moſt of the woods about Dover. In the wood on Lymne-hill, plentifully.

Crepis biennis. On the heights near the Horſe Barracks.

Carduus eriophorus. About a farm called Polton, near Raddigund's Abbey; and about the ruins of Lymne Caſtle.

——— *acaulis.* Abounds on the hills about Dover.

Orchis uſtulata. In the Foreland Meadow, and on the hills about Dover, ſparingly.

——— *militaris.* Found by the Rev. S.L. Jacobs, F.L.S. near Chilton, on the ſide of the path leading from Buſhy Rough to Alkham.

——— *conopſea.* Very luxuriant on the hills about Dover. I counted 229 flowers in one ſpike.

Ophrys Nidus avis. Wood between Alkham and Ewel Minnis.

——— *ſpiralis.* In the Foreland Meadow, and a little eaſt of the Caves.

——— *Loeſelii.* Boggy ground about Ham Ponds.

——— *anthropophora.* Bank weſtward of Crabble.

——— *muſcifera.* Sunny bank at the ſide of Coombe Wood, and, as

I am

I am informed by the Rev. J. Lyon, in ſeveral other ſimilar ſituations about Dover.

Ophrys apifera. Common in ſunny expoſures about Dover: on a barren bank in the lane running eaſt of Barton, plentifully.

—— *aranifera.* On the hills about Dover; ſome years much more plentifully than others.

Serapias latifolia. In the wood between Alkham and Ewel Minnis; and in a wood between Alkham and Raddigund's Abbey.

—— *longifolia.* Boggy ground about Ham Ponds, marſhes about Hacklinge between Deal and Sandwich, and in Wingham marſhes.

Carex pulicaris. Boggy ground about Ham Ponds.

—— *arenaria.* Sand-hills about Deal, Sandwich, and Romney.

—— *diviſa.* Near Ham Ponds and in Sandwich marſhes.

—— *pendula.* Wood on Lymne-hill, abundantly.

—— *diſtans.* Sandwich marſhes and about Ham Ponds.

—— *pſeudo-cyperus.* Ditches between Deal and Sandwich, and in Sandwich Old Haven.

Urtica pilulifera. Is extinct at 'Old Romney;' but a little ſouth of Lyd Church-yard grows plentifully.

Myriophyllum verticillatum. Ditches between Deal and Sandwich.

Salix argentea. A little north of Sandown Caſtle, plentifully. I am obliged to Dr. Smith for its name.

Hippophaë rhamnoides. With the laſt in abundance between Folkſtone and Sandgate, Undercliff, and a little weſt of St. Margaret's Bay.

Atriplex littoralis. About Ramſgate pier, and on the ſhore a little north of Sandwich ſalt-pans.

Equiſetum fluviatile. In Folkſtone Cherry orchard.

Aſplenium Ceterach. On the wall at the entrance into Ewell Church-yard.

Fontinalis ſecunda. On trees weſt of Buckland Church.

Mnium undulatum. } In Walderſhare Shrubbery, in fruit abundantly,
——— *hornum.* } May 14, 1799.

Bryum unguiculatum. On the outſide of the eaſtern inner wall of Dover Caſtle, ſparingly.

——— *triquetrum* β. *Hudſon.* Bank of the rivulet near Cockſhill.

Hypnum luteſcens. Not uncommon on the hills in the neighbourhood of Dover.

——— *Smithii.* On the trees a little north of the Half-way Houſe between Dover and Canterbury; and plentifully on the trees in Walderſhare Park. Early in April, 1800, the veils appeared with upright hairs, agreeing with thoſe of the genus *Orthotrichum*; and I found one with a capſule, but I do not think any came to perfection.

——— *proliferum.* In fruit, near Barham, May 3, 1799.

——— *alopecurum.* Hedge-bank in the dark lane eaſt of Charlton, in fruit, November 26, 1799.

——— *ſquarroſum.* } About the wood near Raddigund's Abbey, in
——— *purum.* } fruit, November 1, 1799.

——— *filiforme.* On trees near Bier.

——— *tenellum.* (*Dickſon, faſc.* 4.) On old walls at the Priory, and other walls about Dover.

Fucus ſanguineus. Frequently waſhed on the Dover ſhore. It is in fructification from December to the latter end of March.

——— *ſinuoſus.*
——— *Hypogloſſum.* } Sometimes, but not frequently, found in the
——— *daſyphyllus.* } neighbourhood.

——— *membranifolius* β. Rocks near the Caves, ſparingly.

——— *fibroſus.* } Sometimes waſhed on ſhore after ſtorms.
——— *bulboſus.* }

——— *crenulatus.* Not unfrequent 'inter rejectamenta;' and at a neap tide

tide I found it on the rocks oppoſite Shakeſpear's Cliff near low water mark.

Fucus loreus. Abounds on the ſhore after ſtorms.

—— *edulis.* Rocks near the Caves, plentifully.

—— *plumoſus.* Rocks about Dover, common.

—— *nodoſus.* Rocks at Folkſtone, abundantly.

—— *Filum.* On the Dover beach only after ſtorms.

—— *radiatus.*
—— *confervoides.*
—— *ſubfuſcus.*
—— *articulatus.*
—— *Opuntia.*

} With many of the more common ſpecies, on the rocks about Dover. Between *F. confervoides* and *F. albidus* I can find no ſpecific difference, and I believe *F. Opuntia* is only *F. articulatus* in a young ſtate.

Ulva dichotoma.
—— *rubra.*

} Are ſometimes found on the beach at Dover.

Conferva equiſetifolia.
——— *verticillata.*
——— *fucicola.*
——— *elongata.*
——— *ciliata.*
——— *noduloſa.*
——— *diaphana.*
——— *byſſoides.*

} With many of the more common ſpecies, are frequently met with on the Dover rocks and beach, as well as ſeveral which, in the preſent ſtate of our knowledge of this genus, cannot be arranged.

——— *gelatinoſa.* In the rivulet which runs acroſs the Victualling-Office yard, and other places about Dover.

——— *glomerata.* About the wooden bridge a little beyond Buſhy Rough.

Agaricus pſittacinus. Wood near Raddigund's Abbey.

——— *varius.* Var. 6, of Withering, as alſo one agreeing with Var. 7. except in having the pileus white, and

Peziza inflexa, in the ſame wood near Raddigund's Abbey.

XVI. *De-*

XVI. *Descriptions of some singular Coleopterous Insects.*

By Charles Schreibers, M. D. Deputy Professor of Natural History in the University of Vienna.

Read April 7, 1801.

LUCANUS ÆNEUS.

TAB. XX. Fig. 1.

LUCANUS oblongus æneus; mandibulis exsertis, brevibus, validis, recurvis, interne ferrugineo hirtis; capite parvo, transverso, subbicornuto; thorace magno, convexo, transverso, margine utrinque angulo deflexo; elytris subcylindricis, convexis, subrugosulis; tibiis anticis latioribus, dentatis, interne lamina cornea falciformi munitis.

Caput transverse oblongo quadratum, breve, thoraci multo angustius, planiusculum, punctis excavatis scabrum, nitidum viridi æneum, interdum ex cupreo incurvatum; triangulo medio magno subexcavato marginibus elevatis glabris, lateralibus postice conniventibus, antice ad latera marginis anterioris ante oculos subprominentibus; hinc caput subbicornutum. Margo anticus subemarginatus.

Oculi laterales, ovati, brunnei.

Antennæ breves, fusco-nigrescentes, glabræ, nitidæ, ante oculos insertæ, thoraci breviores, uni-articulatæ, lateraliter expansæ vel subfissiles, extrorsum crassiores, apice pertusæ, 10-articulatæ: articulo primo maximo, elongato, clavato; 5 insequentibus parvis subæqualibus, submoni-

ſubmoniliformibus; ultimo magno, clavato, ſubperfoliato, foliis 4, quorum primum minimum haud conſpicuum. TAB. XIX. fig. 5.

Mandibulæ porrectæ, capite longiores, validæ, recurvæ, apice latiores, hic truncatæ & emarginatæ, hinc bidentatæ, dente apicis & medio ubi recurvæ, ſpatio inter hos ſubdenticulato. Glabræ ſub lente haud diſtincte punctatæ, interne pilis denſis ferrugineis hirtæ, obſolete viridi æneæ ſubnitidæ marginibus nigreſcentibus. TAB. XIX. fig. 1—3.

Palpi quatuor filiformes, glabri, brunnei, craſſiores; poſterioribus 3-articulatis, articulis fere æqualibus, primo minimo, 2do ſubclavato, 3tio obtuſo-acuminato; ſubincurvis brevioribus: anterioribus longioribus 4-articulatis, articulo primo minimo, 2do elongato ſubclavato, 3tio parvo ſubmoniliformi, ultimo longiori, obtuſo-acuminato. TAB. XIX. fig. 6.

Maxillæ breves, membranaceæ, ſetoſæ. TAB. XIX. fig. 4.

Labium ſuperius nullum; inferius corneum, rotundum, integrum.

Thorax magnus, brevis, elytris latior, convexus, margine utrinque angulo deflexo; margine poſtico parum ſinuato, marginibus lateralibus ſubreflexis; nitidus, viridi-æneus, in medio ſubtiliſſime & ſparſim excavato-punctatus, cæterum glaber puncto excavato majori laterali ſupra angulum deflexum.

Scutellum magnum, ſemicirculare, planum, glabrum, concolor.

Elytra brevia, parum convexa, oblongo-ovata, ſubcylindrica poſtice parum anguſtiora, non connata, marginata, ſubpunctata, ſubrugoſula, nitida, viridi-ænea, totum corpus ambientia, margine ſubreflexo, tuberculo lævi verſus apicem.

Corpus alatum, alis fuſcis; ſubtus æneum, plus minus ex viridi, nitidum, punctatum, ſubvilloſum pilis brevibus ſericeis hinc inde præſertim ad latera ſegmenti primi abdominis, denſioribus, ex cinereo flaveſcentibus.

Abdomen

Abdomen ſegmentis 6, primo (pectore) maximo, craſſo, convexo, acumine brevi porrecto in margine ſuperiori inter femora media; reliqua ſegmenta brevia anguſta, marginibus piceis.

Femora antica craſſa, valida, cylindrica; media cylindrica, graciliora paulo; poſtica compreſſa latiora; omnia nitida, viridi-ænea ſubpunctata, ſubhirta.

Tibiæ anticæ (TAB. XIX. fig. 7.) apice dilatatæ, paulolum compreſſæ, extrorſum dentatæ, dentibus nigreſcentibus 6—7; apice truncatæ, oblique emarginatæ, pilis ferrugineis in faſciculum acutum dentiforme collectis, longioribus, & prope hoc lamina ſat magna, cornea, radiata, falciformis, nitida picea ad angulum internum; tibiæ reliquæ graciles, ſubcylindricæ, ad articulationem tarſorum interius biſpinoſæ; omnes punctatæ, ſubhirtæ, nitidæ viridi-æneæ.

Tarſi 5-articulati, articulis 4 primis moniliformibus, ſubtus ferrugineo-hirtis, ultimo longo, clavato, incurvo; omnibus glabris nitidis, nigro-piceis, unguibus 2 ſat validis, incurvis, acutis, & inter hos in vagina condita ad libitum porrigenda ſpina gracilis apice diviſa in duas multifidas.

VARIETAS.

Paulo minor & color viridi-æneus cum nitore aureo pulcherrimo.

Mandibulæ longiores, prolongatæ, minusque recurvæ, graciliores, flexuoſæ, punctatæ, ſplendentes, nitidiſſimæ, aureæ, apice marginibusque cyaneis, interne pilis denſiſſimis ferrugineis hirtæ.

Structura cæterum mandibularum conſpicue differt & difficillime eſt deſcribenda. Apex ſubrecurvus, latior, bis emarginatus hinc tridentatus, margineque inferiori interne in medio unidentato, dente ſat valido, acuto, antrorſum ſpectante. TAB. XIX. fig. 9—11.

Inter palpos rudimenta penicillorum, *Lucanis* ad inſtar, aſt non

porrecta; & reliquis plane deficientia, ubi ſpatium pilis tantum impletum.

Cætera omnino correſpondent. Elytra levia minime punctata.

FEMINA.

Ejusdem habitus & magnitudinis, paulo tamen anguſtior & magis adhuc cylindrica. Color nigro-æneus cum nitore violaceo.

Triangulum capitis minus diſtinctum.

Mandibulæ multo breviores, fere erectæ, parum incurvæ, apice paulo craſſiores, & hic oblique antrorſum emarginatæ & excavatæ; punctatæ, nitidæ nigreſcentes, interne pilis ferrugineis, ſed minus quam in prioribus, hirtæ.

Thorax magis punctatus & ſcaber.

Tibiæ anticæ (TAB. XIX. fig. 8.) multo graciliores, quamvis apice parum dilatatæ, ſubſulcatæ, punctatæ, extrorſum dentatæ, dentibus 8, 9 ſenſim magnitudine decreſcentibus paulo validioribus; apice minus emarginatæ, pilis aliquot ferrugineis ſolitariis denteque ſat longo, acuto, loco laminæ corneæ, ad angulum internum.

Tibiæ mediæ & poſticæ extrorſum ſpinoſæ.

Cætera conveniunt.

Patria, Nova Hollandia; Inſula Norfolk Maris Pacifici.

Ex Muſeo D. Francillon.

Hoſpitatur in Muſeis D. Banks, D. Marſham, D. Parkinſon.

Deſcripſit jam hoc inſectum clar. Fabricius in Syſtemate ſuo Entomologiæ emendato, *t.* i. *p.* i. *p.* 2. ſub nomine *Lethri æneï*, ex Muſeo D. Banks, ubi dicit: "Forte proprii generis," cum ob defectum palporum genus rite determinare non potuiſſet; cæterum nimis obiter ſpecimen examinaſſe videtur dicendo, elytra "haud connata," quæ primo intuitu perfecte ſeparata apparent. Minime ad genus *Lethri* referendum eſt, cum non ſolum toto habitu, ſed corpore alato,

alato, elytris ſeparatis, tota antennarum, partiumque oris omnium conditione omnino differt. His potius cum *Lucanis* convenit, ſaltem cum aliquis, nam magnam inter varias hujus generis ſpecies obſervavimus characterum diſcrepantiam; differt autem a communi earum conditione habitu, capite parvo, thorace convexo, lateribus deflexis; elytris convexis; antennis articulo primo minus gracili non arcuato, ultimo minus perfoliato; labio inferiori integro corneo; palpis craſſioribus, poſterioribus articulis non ſubæqualibus; penicillorum, ſaltem perfectorum, abſentia, &c.

Proprium hinc certe genus conſtituere videtur, hancque ob rationem ſollicitam partium characteriſticarum deſcriptionem dedimus; pro tempore autem, cum ſingula ſit ſpecies, ad *Lucanos* retulimus.

SCARABÆUS PROBOSCIDEUS.

TAB. XX. Fig. 2.

Ratione habitus, *Copris*, recentiorum.

Ratione capitis thoracisque conditionis pertinet ad familiam ſecundam *Scarabæorum* Fabricii.

SCAR. ſcutellatus ferrugineus; thorace mutico ſubretuſo; clypeo poſtice bilobato, antice in medio prolongato, cornu brevi, erecto, obtuſo, emarginato; apice ſubemarginato in roſtrum gracile, ſubattenuatum, ſubdecurvum, terminante.

Color totus ferrugineus, interdum obſcurior & nigricans.

Clypeus thoraci multo anguſtior, planiuſculus, poſtice ad utrumque latus in lobum ocularem dilatatus, antice in medio prolongatus in laminam cujus margines laterales per lineam elevatam ſupra caput ad baſin uſque ſeſe extendunt, & ſic lobos poſticos laterales a clypeo ipſo diſtinguunt. In laminæ hujus medio, a thorace conſiderato,

ſiderato, cornu breve ſeu tuberculum erectum, apice obtuſo-emarginatum. Lamina ipſa verſus apicem dilatatur, & hic ſubemarginata prolongatur in roſtrum longitudine totius clypei, gracile, ſubattenuatum, quadrangulare, ſubdecurvum, apice craſſiori marginato proboſcideo, furcato, furcis lateralibus deorſum ſpectantibus apice paulo magis divaricantibus. Roſtriformis hæc clypei prolongatio valde ſingularis eſt ſolida atque imperforata. Subtus lamina clypei in medio elevata, paulolum ſupra os fulcro verticali, longitudine 3 linearum, apice furcato, munita eſt. TAB. XIX. fig. 12.

Clypeus præſertim antice & roſtrum ſub lente ſcabriuſcula; cæterum ſubnitida, ferruginea, marginibus omnibus, apice tuberculi medii, apice furcisque roſtri, nigris. Latera clypei totius præſertim poſtice pilis ferrugineis in faſciculos longos, acutos collectis.

Antennæ ferrugineæ, clava magna ovato-rotundata, ſublamellata.

Thorax brevis, elytris latior, valde convexus, ſubretuſus, inermis, forma & conditione feminæ *Scar. 4-dentis*, *Cyclopis*, &c. ſimilis, at non ad margines laterales anticos dilatatus ut in *Cyclope*. Ad latera punctis impreſſis ſubſcabriuſculus, antice & in medio glaber, macula rotundata impreſſa ſupra marginem lateralem; marginibus omnibus elevatis, lateralibus faſciculis piloſis, ferrugineis acuminatis, ciliatis; margine poſtico rotundato-truncato. Cæterum ſubnitidus, ferrugineus.

Scutellum magnum, triangulare, planum, concolor.

Elytra valde convexa, totum corpus ambientia, excavato punctato-ſtriata, ſubnitida, ferruginea.

Corpus ſubtus ſubſcabriuſculum, obſolete ferrugineum, pilis ſat longis ferrugineis undique hirtum.

Pedes concolores, hirti; femoribus anticis & poſticis incraſſatis; tibiis anticis extrorſum dentatis, dentibus 5 validis ſenſim decreſcentibus nigris;

nigris; tibiis mediis & poſticis triquetris, valde ſpinoſis; tarſis hirtis verſus inſertionem nigro marginatis.

Femina incognita.

Magnitudine *Scarabæo Cyclopi* accedit, *Sc. quadridentem* multum ſuperat.

Habitu & forma immo & colore *Scarabæis Cyclopi*, *Coriphæo* & *quadridenti* accedit.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

SCARABÆUS DYTISCOIDES.

TAB. XX. Fig. 3.

Ratione capitis thoracisque conditionis pertinet ad familiam ſextam *Scarabæorum* Fabricii.

SCAR. exſcutellatus, muticus, niger, opacus; clypeo bidentato; thorace ſubplaniuſculo, conico; elytris latis, planis, apice rotundatis, dentatis, ſtriatis; tibiis anticis ſexdentatis, poſticis ciliatis; tarſis mediis longiſſimis.

Clypeus ſubovatus, poſtice convexiuſculus, antice ſubexcavatus, ſub lente punctis minimis ſubſcabriuſculus, niger, opacus; margine laterali hirto, parumper reflexo, antico ſubemarginato & in medio bidentato, dentibus longioribus, acutis, ſubreflexis, approximatis, antrorſum divergentibus.

Antennæ nigræ, clava cineraſcente.

Thorax ſubplaniuſculus, conicus, poſtice elytrorum fere latitudine, antice multo anguſtior, utrinque truncatus, paulo latior quam longus, lateribus antice ſubinflexis; niger opacus, ſub lente ſubſcabriuſculus.

Scutellum

Scutellum nullum diſtinctum, aſt elytra hoc loco ſpatium triangulare ſat magnum haud impletum formant.

Elytra ovata, plana, totum corpus tegentia, apice rotundata, tenuia, opaca, nigra, ſub lente punctis minimis elevatis crenulata, longitudinaliter ſtriata, ſtriis leviter impreſſis 7 in utroque, ſulcoque elevato verſus marginem lateralem. Dentes 7 in utroque verſus apicem, quorum unusquisque inter duas ſtrias impreſſas parum oblique poſitus ſat validus, baſi latior, triangularis, compreſſus.

Anus magnus truncatus, triangularis ut in *Scar. ſacro* & *gibboſo*, margine utrinque elevato, glaber, opacus, niger, ſub lente crenulatus.

Corpus ſubtus nigrum, nitidum, *Sc. ſacro* ſimile.

Femora antica valida, compreſſa, clavata; media paulo graciliora compreſſa, ſubcurvata; poſtica graciliora compreſſa; omnia glabra nitida, marginibus pilis longis, atris, hirtis.

Tibiæ anticæ hirtæ, extrorſum dentatæ, dentibus 6, validis longis acutis, 3 primis longiſſimis fere æqualibus.

Tibiæ mediæ graciles, ſubtriquetræ, hirtæ, ſpinoſæ, apice ſpinis duabus longioribus.

Tibiæ poſticæ validiores, triquetræ, pilis denſis, longis, atris ad margines ut in *Sc. ſacro*, ciliatæ, apice ſpina unica munitæ.

Tarſi hirti, ſpinoſi, antici breviſſimi; poſtici paulo longiores; medii longiſſimi, triplo poſticis & quidem ipſis tibiis longiores.

Magnitudine *Scar. ſacrum* æquat.

Habitu & forma *Sc. ſacro* & ſimilibus accedit, aſt thoracis figura ſingulari conica, anguſta, elytris complanatis pedibusque multo longioribus multum differt, & primo intuitu *Dytiſci* ſimilitudinem refert.

Patria, Braſilia.

Ex Muſeo D. Francillon.

CETONIA PHILIPSII. (SCARABÆUS *Linn.*)

TAB. XX. Fig. 4.

CET. clypeo elongato, emarginato, atro; thorace planiuſculo piceo marginibus atris; elytris planiuſculis, atris, ſulcatis, ſulcis excavatis latis ex fulvo hirtis.

Clypeus magnus, planus, elongatus, cylindricus, apice emarginatus, denſim excavato punctatus, margine laterali elevato, ater, opacus.

Oculi laterales fuſcoflaveſcentes.

Antennæ atræ, ſtructura communi, at articulus primus valde magnus.

Thorax planiuſculus, antice anguſtior, ad latera parum ſinuatus, poſtice latior, at elytris paulo anguſtior, margine poſtico ſinuato, laterali ſubreflexo; leviter excavato punctatus, magis conſpicue ad latera, haud nitidus piceus, marginibus omnibus atris.

Scutellum magnum, planum, triangulare, atrum.

Elytra plana, corpore haud breviora, apice paulo anguſtiora quam baſi, haud nitida, glabra, atra, ſulcis in utroque quatuor longitudinalibus leviter excavatis, nec baſin nec apicem attingentibus, pilis brevibus fulvis repletis; duobus exterioribus haud diſtinctis, interiori breviſſimo, medio latiſſimo, cujus margines elevatæ verſus apicem connivent & tuberculum leve formant.

Corpus ſubtus atrum, opacum, craſſum pilis fuſcis hinc inde hirtum, ſterno porrecto, compreſſo, ſubtriangulari.

Pedes atri, femoribus anticis hirtis brevioribus, poſticis 4 incraſſatis, compreſſis; tibiis anticis brevioribus, ſubpalmatis extrorſum tridentatis; mediis et poſticis cylindricis, extrorſum in medio unifpinoſis, apice 4-ſpinoſis; tarſis 5-articulatis.

Magnitudine *Cetoniæ* (Scarabæum *Linn.*) *faſcicularem* multum ſuperat.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

SILPHA LACRYMOSA.

TAB. XX. Fig. 5.

SILPH. atra; thorace plano in medio atro tuberculato, lateribus late marginatis testaceis; elytris subconvexiusculis medio atris, apice & ad latera testaceis, maculis oblongis deorsum incrassatis, elevatis.

Caput deflexum, oblongo-quadratum, glabrum, opacum, atrum, linea transversa, elevata, subsinuata cervicis inter oculos, aliaque haud distincta frontali, media, longitudinali.

Oculi laterales, ovati, testacei.

Antennæ subhirtæ, atræ, articulis 3 ultimis rufis.

Thorax planiusculus, latus, margine antico emarginato, postico subsinuato-truncato, laterali rotundato, subreflexo; antice parum angustior, & tota forma *Silphæ thoracicæ* & similibus accedens; glaber, opacus, minime nitidus, in medio ater & hic tuberculis aliquot irregularibus, parum nitidis notatus, ad latera testaceus, colore thoraci *Silph. thoracicæ* omnino simili, at minime nitido, per atrum in medio emarginato.

Scutellum magnum, planum, subexcavatum, triangulare, atrum.

Elytra parum convexa, basi thoracis latitudine, apice latiora dilatato-rotundata, margine laterali subexcavato, subreflexo; in medio atra, opaca, lateribus & apice late testaceis, maculis elevatis paulolum nitidis, glabris, lacrymosis, in utroque 10. Tres ad suturam superiori lineari, media infra hanc, oblonga deorsum crassiori, tertia minori, ovata; quatuor in medio, prima lineari, secunda oblonga deorsum incrassata, tertia oblonga valde incrassata, simillima guttulæ seu lacrymæ deploranti, ultima oblonga, obliqua, interdum divisa versus apicem. Tres exteriores subrotundæ minimæ.

Omnes, ultima apicis excepta, diſcum atrum obſident. Plurimæ earum ob figuram oblongo-ovatam deorſum incraſſatam ſimiles ſunt guttulis decadentibus ſeu lacrymis, & tres ſeries longitudinales haud regulares conſtituunt.

Color ater diſci elytrorum tantum a corpore tranſparente, ſic ut thoracis, maculæ autem atræ per ſe.

Corpus ſubtus cum pedibus atrum, ſubnitidum.

Pedis poſtici longiores, antici breviſſimi.

Magnitudo *Silph. littoralis* ut habitus, quamvis elytra apice latiora & thoracis forma diverſa.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

Hoſpitatur etiam in Muſeo D. Marſham.

CLERUS FASCICULATUS. (ATTELLABUS *Linn.*)

TAB. XX. Fig. 6.

CL. niger; thorace ſubgloboſo, ſcabro, pubeſcente, atro; elytris elongatis, cylindricis, porcatis, nigris, baſi faſciculis duobus piloſis, erectis, faſciaque lata tranſverſa, albomarginata, ſubpubeſcente, nitida verſus apicem, atris; antennis flaveſcentibus.

Caput thoraci inſertum illoque paulo anguſtius, margine antico ſubemarginato, laterali antice ante oculos elevato; punctis excavatis, denſis, ſcabrum, ſubpubeſcens præſertim ad latera pilis longioribus atris, hinc inde cineraſcentibus; ſubnitidum, atrum.

Oculi laterales, ovati, nigro-picei.

Antennæ craſſæ, moniliformes, extrorſum craſſiores, articulis 3 ultimis majoribus, *Clero apiario* ſimiles, flaveſcentes.

Palpi quatuor, ſecuriformes omnes, quamvis articulus ultimus anticorum minor. His differt a communi hujus generis conditione

partium oris, & convenit cum *Cl. apiario* pari modo diſcrepante.

Thorax convexus, ſubgloboſus, immarginatus, antice truncatus, poſtice rotundatus, punctis impreſſis ſcaber, pilis atris & hinc inde cineraſcentibus, pubeſcens, hirtus, ater.

Scutelli loco punctum villoſum, cinereo-album.

Elytra convexa, ſubelongata, cylindrica, apice rotundata, humeris paulo prominulis, opaca, nigra, punctis majoribus, profunde excavatis, denſis, catenulatis, porcata; faſciculo in utroque, magno, erecto conico, atro, verſus baſin a pilis denſis conflato, alioque multo minori, haud diſtincto infra hoc & ſupra medium elytri, cinereo; faſciaque lata, communi, tranſverſa, ſinuata, ſubpubeſcente, ſubnitida, atra pilis cineraſcentibus marginata, poſtica, apicem excludente. Macula parva, glabra, lutea ad marginem exteriorem in directione parallela cum faſciculo cinereo, aliaque paulo majori tali infra illam ad marginem & angulum externum, ſuperiorem faſciæ.

Corpus atrum, hirtum ſubpubeſcens, abdomine polline flavo adſperſo.

Pedes atri, rugoſuli, hirti, femoribus anticis paulo craſſioribus; tarſis 4-articulatis, piceis, ſubtus flavo-fuſcis, hirtis, pubeſcentibus; *Cler. apiario* ſimiles forma, breviores, latiores, articulis magis emarginatis quam in *Cler. mutillario* Fabr.

Duplo major eſt *Clero mutillario*, & inter hanc & *Clerum apiarium* medium tenet; convenit cum priori habitu & colore, differt autem conſpicue reſpectu conditionis antennarum, palporum, tarſorumque.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

PRIONUS

PRIONUS LEPIDOPTERUS. (CERAMBIX *Linn.*)

TAB. XXI. Fig. 1.

PR. thorace ſubcylindrico, convexiuſculo, ſubunidentato, ſubvilloſo, rufo-piceo nigro-maculato; elytris ſubcoriaceis, abdomine brevioribus, apice dehiſcentibus, truncatis, ſubemarginatis, humeris ſubgibboſis, margine laterali deflexo; lineatis ſubnitidis, rufo-piceis, maculis ovatis, villoſis, ex flavo cineraſcentibus; abdomine elongato, ſphingiformi variegato.

Caput thoraci anguſtius, inſertum, transverſum, planiuſculum, atrum, fronte & margine laterali pilis denſis, brevibus ex flavo cineraſcentibus, pubeſcentibus; mandibulis porrectis, ſimplicibus, apice mucronatis, incurvis, baſi hirtis, atro-piceis, longitudine capitis.

Oculi transverſi, ſubreniformes, marginales, fuſci.

Antennæ ſetaceæ, atræ, elytris haud breviores.

Thorax brevis, transverſus, ſubconvexus, ſubcylindricus, margine laterali in medio ſubunidentato; ſubvilloſus, magis ad latera pilis breviſſimis ex flavo cineraſcentibus; cæterum glaber, ſubnitidus ex rufo-piceus, margine laterali maculisque duabus magnis, irregularibus, dorſalibus, vitta longitudinali pubeſcente a margine laterali diſtinctis, vel lateribus late, dorſoque atris.

Scutellum magnum, planum, triangulare, atrum.

Elytra ſubcoriacea, elongata, ſubcylindrica, abdomine breviora, apice anguſtiora & ab invicem dehiſcentia, truncato-ſubemarginata, margine laterali deflexo, verſus baſin impreſſo, hinc humera gibboſa; margine, ſutura lineisque elevatis in utroque quatuor longitudinalibus; quarum exterior ſubdiſtincta in margine deflexo, abbreviata a baſi & apice remota; inſequens ibi ubi margo deflectit ab humere ad apicem uſque; tertia infra baſin uſque paulo ante apicem; quarta interna a latere ſcutelli, breviſſima.——

Elytra

Elytra cæterum glabra, ſubnitida, rufo-picea, maculis ovatis & oblongis, majoribus, ex pilis brevibus, denſis, ex flavo cineraſcentibus, pubeſcentibus; irregulariter variegata.

Thorax & pectus ſubtus atra denſim ex cinereo pubeſcentia.

Abdomen elongatiſſimum, craſſum, teres, ſenſim verſus apicem attenuatum, paulum ad unum alterumve latus flexum, apice obtuſo acuminato; glabrum, nitidum, rufum, margine ſuperiori omnium ſegmentorum late atro, maculaque magna, tranſverſa, oblonga pubeſcente, cinereo-flaveſcente ad latus utriusque ſegmenti, ultimo excepto rufo nigroque indiſtincte variegato.

Singularis abdominis forma & pictio magnam cum Sphingibus affinitatem & ſimilitudinem refert.

Pedes breves, anteriores breviores, ultimi longiores ex rufo teſtacei, femoribus ſubpubeſcentibus, tibiis interne ſubbiſpinoſis, plantis ſubtus ſericeis.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

CERAMBIX GIRAFFA.

TAB. XXI. Fig. 2.

CER. obſcurus, immaculatus; thorace inermi elongato, in medio anguſtato, tranſverſim rugoſulo; elytris ſubconvexis, baſi ſcabriuſculis, apice glabrioribus, ſcutello cineraſcente, villoſo.

Caput anguſtum, cylindricum, vertice elongato, linea dorſali, media ſubdiſtincta, nitidiori, ſubimpreſſa; haud nitidum, atrum, glabrum, vage & ſparſim excavato punctatum, fronte inter antennas profunde canaliculata, mandibulis validis, incurvis, acutis, compreſſis.

Oculi atri, reniformes, ad antennarum radicem, easque ambientes.

Antennæ

Antennæ corpore duplo longiores, atræ, ſubſcabriuſculæ, articulis 5, 6, 7, 8, paulum arcuatis.

Thorax anguſtus, medio anguſtiſſimus, valde elongatus, una cum capite elytrorum longitudine, inermis, immarginatus, teres, antice latitudine capitis, poſtice paulo latior, at elytris anguſtior, nitidus, niger, denſim tranſverſim rugoſulus.

Scutellum ſat magnum, ſemirotundum, planum, tomentoſo-cineraſcens.

Elytra convexiuſcula, ſubcylindrica, apice parum rotundato-attenuata, angulis humeralibus paulo prominulis; nitida, obſcura, ex fuſco-viridana, ſubænea, colore *Lamiæ* (Cerambici *Linn.*) *Sartori* affinia, baſi uſque ad medium ſcabra, a medio ad apicem glabra.

Corpus ſubtus nigrum; thorax tranſverſim rugoſulus.

Pedes unicolores, antici longiſſimi, longitudine totius corporis; medii multo breviores; poſtici breviſſimi.

Femora gracilia, ſubcylindrica, in medio parum incraſſata, mutica.

Tibiæ graciles, anticæ verſus apicem dente acuto interius; mediæ & poſticæ eodem loco ſed exterius dente obtuſo armatæ.

Tarſi quadriarticulati, articulis conicis, tertio emarginato, 4to ungulato, antici multo majores, barbati.

Aliud ſpecimen, forte ſexus alter, minus, antennis brevioribus articulis non arcuatis, thorace multo breviori, nec tam anguſto, pedibus omnibus æqualibus, tarſis anticis non majoribus nec barbatis.

Differt a *Cerambice longicolli* Fabricii (*Entom. Syſt. emend. t.* i. *p.* 2. *p.* 265. *n.* 52. *Olivier Ent. t.* ii. *f.* 73.) cui habitu ſimilis; thorace rugoſo, in medio anguſtiſſimo; elytris immaculatis; tibiis omnibus & diverſo modo dentatis, pedibus anticis longiſſimis tarſis anticis barbatis, &c.

Diverſa omnino hinc ſpecies eſſe videtur, quamvis femina minus diſcrepat nullo modo *C. longicolli* confundenda antennarum longitudine ſatis diſtincto.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon, D. Marſham.

CERAM-

CERAMBIX FICHTELII.

TAB. XXI. Fig. 3.

CER. æneus; capite latiſſimo, transverſo, tuberculo laterali villoſo ferrugineo-flaveſcente, oculum dividente; thorace anguſto cylindrico; elytris abdomine multo longioribus, valde attenuatis, apice prolongatis, divergentibus, ſubbarbatis.

Caput breve, latiſſimum, transverſum, planum, nigrum, pilis denſis, tenuibus, ſericeis, nitidis, æneis, villoſum linea media dorſali impreſſa. TAB. XIX. fig. 13.

Oculi laterales, gibbi, per tuberculum ſericeo-villoſum, ferrugineo-flavum, poſt antennas ſituatum, tali modo diviſi ut duo ad utrumque latus appareant. In omnibus quidem *Cerambicibus* Linn. *Prionis*, ſcilicet, *Lamiis*, *Saperdis*, &c. Fabr. oculi ſunt magni lunati, arcuati vel reniformes, antennarumque inſertionis tuberculum plus minus circumambientes. Singulare autem in hac ſpecie eſt, eos tuberculo proprio, magno, tali modo diviſos vel interruptos eſſe ut immo ſub lente vix ulla eorum appareat connectio. TAB. XIX. fig. 14. Oculus externus gibboſus, pars ejus poſterior ad verticem poſt antennas haud convexa, ovata.

Antennæ corpore longiores, ſetaceæ, nigreſcentes.

Frons latus, tranſverſus; labium ſuperius anguſtum, hirtum, piceum.

Mandibulæ exſertæ, apice acuminatæ, incurvæ, baſi latæ, compreſſæ; nitidæ, piceæ, ſulco laterali, lævi, hirto, exaratæ.

Thorax planiuſculus, cylindricus, muticus, immarginatus, tranſverſim rugoſulus, poſtice in medio impreſſus, nigro-æneus, lineis duabus vel quatuor, plus minus diſtinctis, dorſalibus, longitudinalibus, ſericeo-villoſo-æneis, punctisque duobus majoribus, plus minus conſpicuis flaveſcentibus ad utrumque latus.

Scutellum

Scutellum parvum, ſubquadratum, planum, medio ſubimpreſſum, glabrum, nitidum, obſcure æneo-nigrum.

Elytra ſubconvexa, baſi thoraci paulo latiora, abdomine multo longiora, elongata, apice valde acuminato-attenuata, prolongata, anguſtiſſima, imo apice ab invicem divergentia & pilis nigris ciliato-barbata; glabra, ſubnitida, villoſula, obſcure ænea, ſutura, a medio ad apicem, ſulcoque longitudinali, a baſi ad apicem elevatis.

Thorax ſubtus & pectus, nigra, ſericeo-villoſa, macula laterali diſtincta, ovata, villoſa, lutea ad marginem pectoris poſticum, aliaque ſubdiſtincta tali ad marginem anticum priori parallela.

Abdomen ſubtus nigro-piceum, glabrum, nitidum, macula utrinque laterali, parva, villoſa, lutea, ad utriusque ſegmenti marginem inferiorem.

Pedes obſcure ænei, villoſi, femoribus omnibus paulum inflatis.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

SCARITES SCHROETTERI. (CARABUS *Linn.*)

TAB. XXI. Fig. 4.

SCAR. ater; capite magno, porrecto, poſtice bituberoſo, mandibulis magnis exſertis, baſi unidentatis; thorace planiuſculo, marginato, ſubcordato; elytris planiuſculis cylindricis, marginatis, ſtriatis; tibiis anticis palmato-ſubdentatis, poſticis incurvatis.

Omnium longe maximus, ater, nitidus.

Caput magnum, porrectum, ſubquadratum, thoracis latitudine, poſtice anguſtatum in collum teres, craſſum, (TAB. XIX. fig. 16. a.a.) fronte ſubimpreſſa, ſubrugoſa (e); poſtice ad latera tuberoſum, tuberculo utrinque ſat magno, rotundo poſt oculos (b), ſulcoque

elevato, longitudinali laterali, abbreviato, ab antennarum inſertionis loco ad tuberculum uſque decurrente (d).

Antennæ moniliformes, haud thoracis longitudine, articulo primo maximo, craſſo, cylindrico, 3 inſequentibus moniliformibus, multo minoribus, primo ex his minimo, 7 ultimis his paulo majoribus, æqualibus, compreſſis, marginibus villoſis, hirtis ferrugineo-fuſcis; cæterum atræ, lateraliter inter oculos & mandibulas inſertæ. TAB. XIX. fig. 16. g. h. i.

Oculi ſubgloboſi, laterales, fuſci. TAB. XIX. fig. 16. c.

Mandibulæ magnæ, validæ, craſſæ, exſertæ, porrectæ, longitudine capitis, excepto collo, arcuatæ, incurvæ, acutæ, ſtriatæ, baſi multo craſſiores, interne dente valido, obtuſo, exterius dilatatæ ſubunidentatæ. TAB. XIX. fig. 15. b—f. fig. 16. k.

Palpi ſex, filiformes, inæquales; anteriores breviores, biarticulati (fig. 17. a); medii longiores, 4-articulati, articulo primo minimo (b); poſteriores longiſſimi, 4-articulati, articulo primo craſſo, minori, cylindrico rufo (fig. 18). Cæterum obtuſo-acuminati, ſubhirti, nigri.

Maxillæ acutæ, ſubarcuatæ, corneæ, interne pilis ferrugineis ciliatæ. TAB. XIX. fig. 15. g.

Labium ſuperius corneum, emarginatum.

Labium inferius majus, corneum, ſubtridentatum, dentibus externis multo majoribus, rotundatis, medio minimo, diviſo. TAB. XIX. fig. 15. h. h. i.

Thorax a communi hujus generis ſtructura diverſus, nam ſubcordatus ut in familia prima Caraborum, antice elytrorum latitudine, poſtice anguſtior; planiuſculus, margine laterali reflexo, antico & poſtico truncatis, angulis ſubprominulis, obtuſis. Glaber, ad latera ſubſtriatus, ſtriis transverſis levibus, linea dorſali media ſubimpreſſa, aliaque laterali abbreviata, curva ad angulos poſticos.

Scutellum

Scutellum mediocre, planum, ſubcordatum.

Elytra oblonga, cylindrica, non connata, convexiuſcula, profunde longitudinaliter ſtriata, ſtriis in utroque 7 ante apicem conniventibus; apice rotundata, ſubſinuata, lateribus deflexis ante marginem ſulco lato, leviter excavato, rugoſula, margine ipſo ſubreflexo.

Thorax ſubtus convexus, ſulco abbreviato impreſſo in medio.

Pectus convexum, ſulco longitudinali impreſſo in medio, ſulcoque elevato, ſubarcuato ad utrumque latus.

Abdomen breve, convexum, ſegmentis anguſtis.

Femora antica brevia, incraſſata, poſticæ thoracis parti inſerta.

Femora media paulo graciliora, pectoris baſi inſerta.

Femora poſtica dimidio fere prioribus longiora, craſſa, ſubcylindrica, valde poſtica, haud 8 lin. ante anum abdomini inſerta.

Tibiæ anticæ compreſſæ, dilatato-palmatæ, inferius ſcabræ, apice dentibus ſeu ſpinis 3 acutis, ſat longis; margine exteriori parum ſinuato, in medio paulum extenuato; margine interno excavato & hoc loco dente ſeu ſpina ſat longa, acuta, deformi, incurva, armato. TAB. XIX. fig. 19.

Tibiæ mediæ graciles, ſubcylindricæ, ſubcompreſſæ, ſcabræ, ſubſpinoſæ, apice dente ſuperius, & ſpinis duabus, acutis, inferius, armatæ.

Tibiæ poſticæ ſubcylindricæ, ſubcompreſſæ, ſubarcuato-incurvæ, ſubſpinoſæ, apicis dente interno, ſpinisque duabus inferius.

Tarſi omnes 5-articulati, articulo 1mo & 5to longioribus, 3 mediis æqualibus, conicis.

Patria, Nova Hollandia.

Ex Muſeo D. Francillon.

ANNOTATIO.

Genus, *Scarites*, a Fabricio Entomologisque recentioribus conſtructum, comprehendit ſpecies a Linnæo promiſcue ſub *Caraborum Tenebrionum*que nomine deſcriptas, multasque alias recenter detectas, characteribus omnino diſtinctis ſatis differentes. Differunt a *Carabis*, quibus habitu ſimillimi forte, capite thoraceque magnis, latis; mandibulis validis, porrectis dentatis; antennis moniliformibus (non filiformibus) brevioribus craſſioribus; palpis filiformibus, minime truncatis; labio dentato, non truncato; tibiis anticis dentatis, &c.

Hæc ſupra deſcripta ſpecies a communi *Scaritum* ſtructura characteribusque huic generi adſcriptis, aliquantum differt, haneque ob rationem accuratiorem dedimus deſcriptionem.

EXPLICATIO TABULARUM.

TAB. XIX.

Lucanus æneus.

Mas.

Fig. 1. Capitis cum mandibulis pagina inferior.
2. Mandibula a latere conſpecta.
3. Mandibulæ pagina inferior.
4. Maxilla.
5. Antenna.
6. Palpi.
7. Maris tibia et tarſus anterior.
8. Fœminæ tibia et tarſus anterior.

Ejusdem varietas.

9. Capitis cum mandibulis pagina inferior.

10. Mandibula

Fig. 10. Mandibula a latere conſpecta.
11. Mandibulæ pagina inferior.
12. Clypeus *Scarabæi proboſcidei.*
Cerambix Fichtelii.
13. Caput a fronte adſpectum.
14. Oculi diviſio per tuberculum.
Scarites Schroetteri.
15. Labium inferius cum mandibula maxillaque.
a. Margo capitis inferior.
b. Mandibula arcuata incurva.
c. Extenuatio dentiformis exterior.
d. Dens internus baſeos validus obtuſus.
e. Apex acutus incurvus.
f. Sulci abbreviati.
g. Maxilla arcuata acuta interne ciliato-piloſa.
h. h. Labium inferius corneum magnum valde emarginatum,
i. ſubdentatum in medio, dente bifido.
16. Labium ſuperius cum antenna, &c.
a. a. Collum.
b. Tuberculum poſt oculum.
c. Oculus.
d. Sulcus elevatus lateralis.
e. Impreſſio frontalis.
f. Labium ſuperius emarginatum.
g. Antennæ articulus primus cylindricus maximus.
h. Articuli tres inſequentes ſubæquales moniliformes.
i. Articuli 7 ultimi compreſſi.
k. Mandibula.
17. a. Palpus anterior.
b. Palpus medius.

18. Palpus

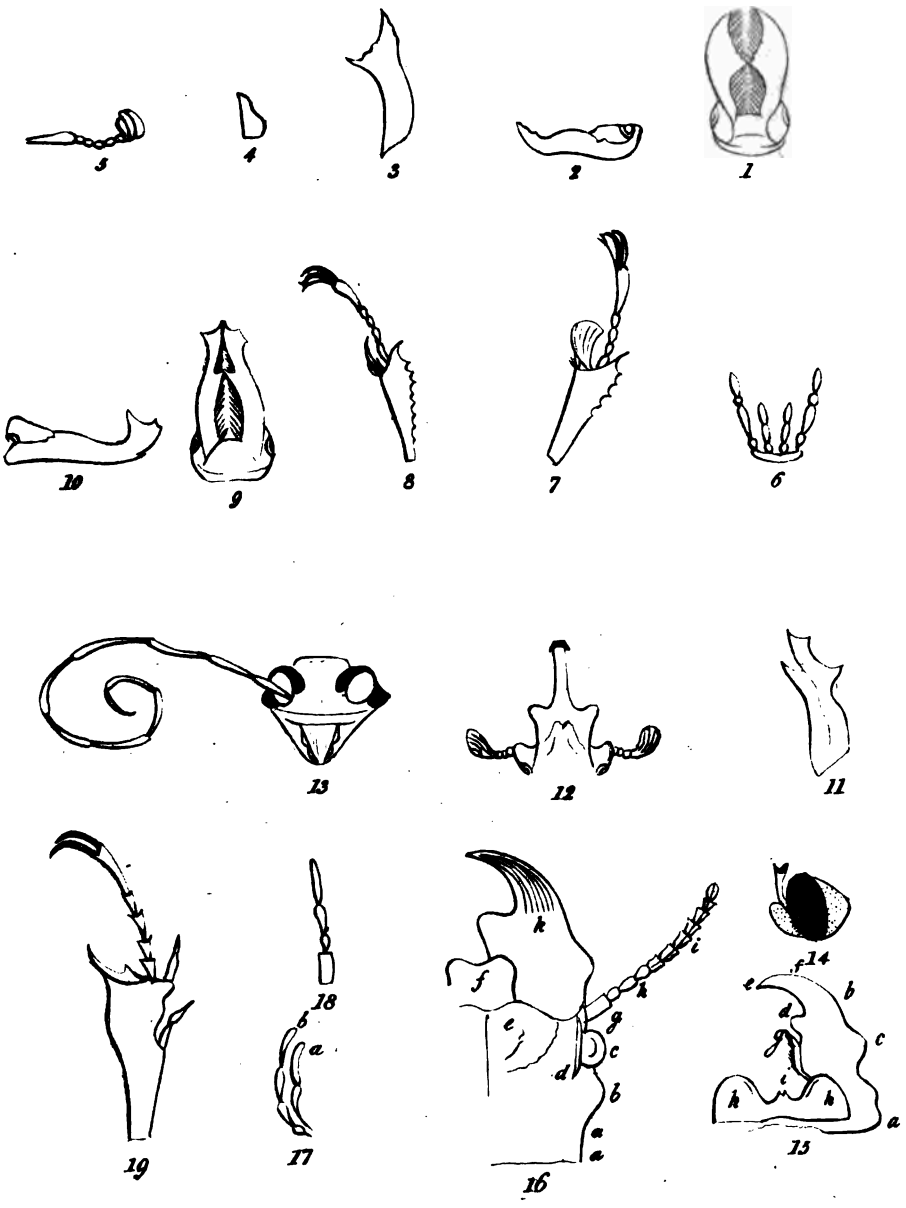
Fig. 18. Palpus poſticus.
19. Tibia et tarſus anterior.

TAB. XX.

1. Lucanus æneus.
2. Scarabæus proboſcideus.
3. Scarabæus dytiſcoides.
4. Cetonia Philipsii.
5. Silpha lacrymoſa.
6. Clerus faſciculatus.

TAB. XXI.

1. Prionus lepidopterus.
2. Cerambix Giraffa.
3. Cerambix Fichtelii.
4. Scarites Schroetteri.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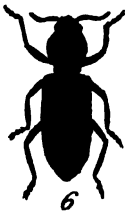
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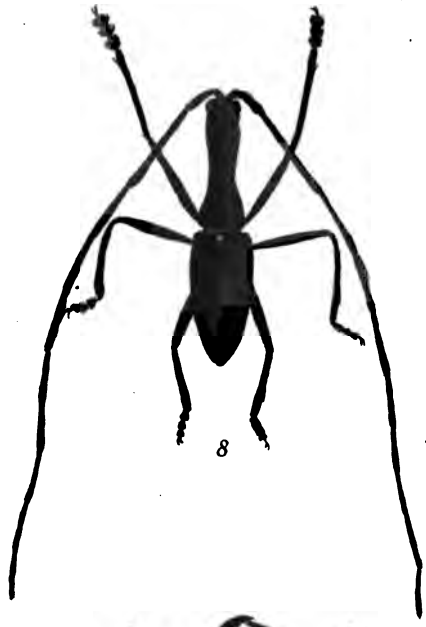

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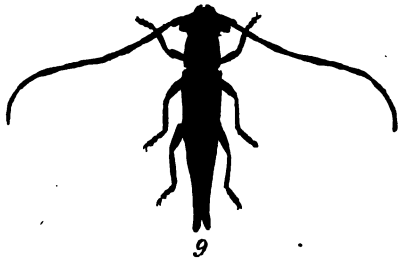

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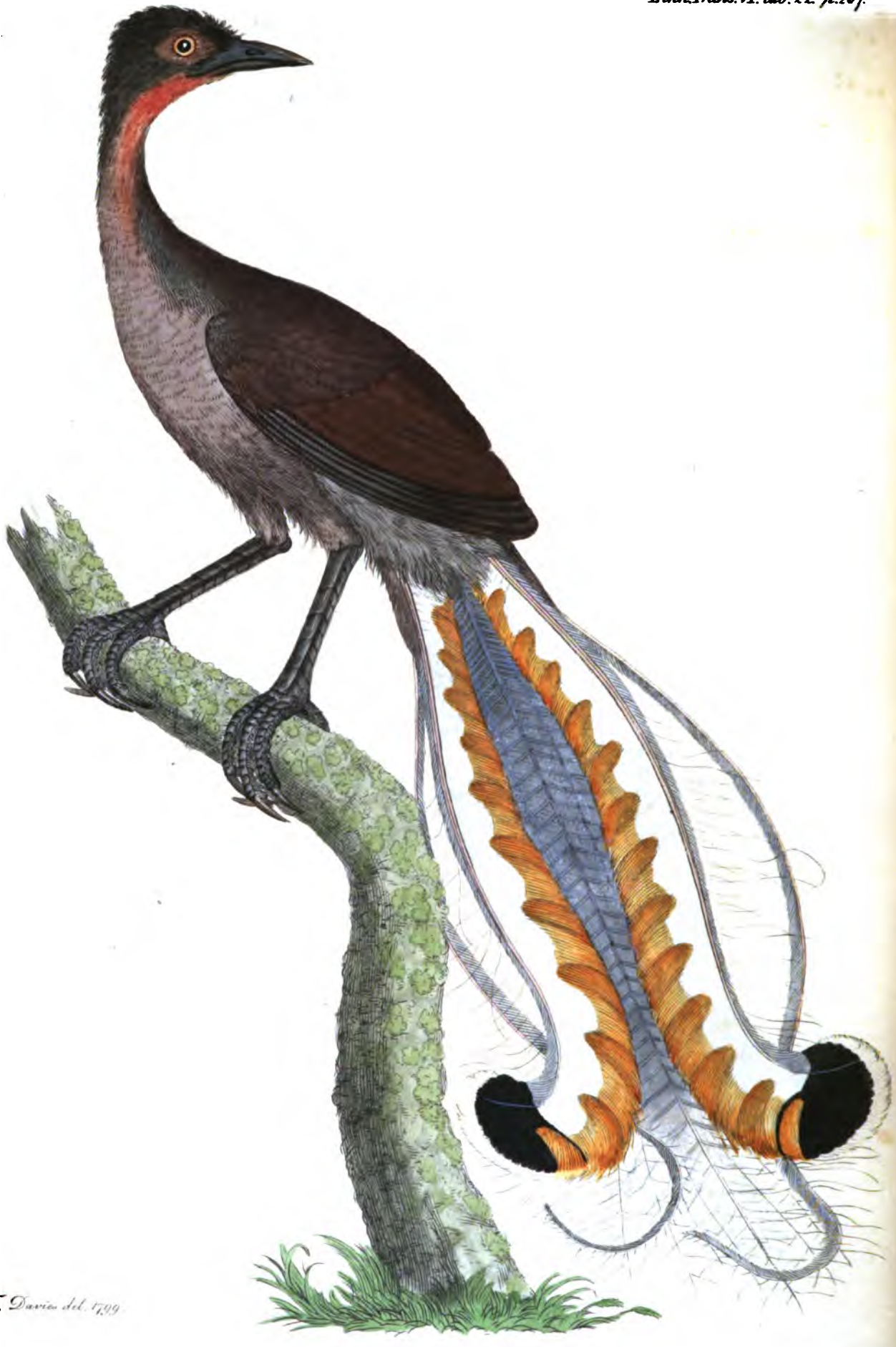


T. Davies del. 1799.

XVII. *Deſcription of Menura ſuperba, a Bird of New South Wales. By Major-General Thomas Davies, F.R.S. and L.S.*

Read November 4, 1800.

MENURA.

CHAR. GEN. *Roſtrum* validiuſculum, convexo-conicum.
Nares ovatæ in medio roſtri.
Rectrices elongatæ, pinnulis decompoſitis; intermediæ 2 longiores anguſtæ, exteriores ad apicem patulæ, revolutæ.
Pedes validi ambulatorii.

MENURA SUPERBA.

TAB. XXII.

THE total length of this ſingular bird from the point of the bill to the end of the broad tail feathers is 43 inches; 25 of which are in the tail alone. The bill rather exceeds an inch in length, is ſtrong, formed much like that of a peacock, and black, with the noſtrils, which are long open ſlits, rather large, placed near the middle of its length. The head, which is ſomewhat creſted at the hind part, neck, ſhoulders, back, upper tail coverts, and upper ſurface of the tail feathers, of a dark browniſh black. Throat rufous, reaching ſome way down the middle of the neck. Breaſt, belly, and vent gray. The feathers of the latter are long, very ſoft, and of a ſilky texture. Thighs nearly of the ſame colour, rather long, and feathered

down to the knee. Scapulars of a browniſh tinge. Upper tail coverts, and prime quill feathers, which are ſomewhat curved at the ends, brown black. Edges of the quills gray. The legs long and very ſtrong, covered with large ſcales, eſpecially in front. The feet, which are likewiſe large, and the nails, are black; the laſt ſomewhat crooked, convex above and flat beneath; the hind nail near three quarters of an inch long.

The tail conſiſts, in the whole, of ſixteen feathers; all of which, except the two upper or middle ones, and the two exterior on each ſide, have long ſlender ſhafts furniſhed on each ſide with delicate long filaments, four inches or more in length, placed pretty cloſe towards the rump, but more diſtant from each other as they approach the extremity, and reſemble much thoſe of the Greater Paradiſe Bird. The two middle or upper ones are longer than the reſt, ſlender, narrow at the baſe, growing wider as they approach the ends, which are pointed; webbed on the inner edge all the way, and furniſhed with ſome diſtant hair-like threads near the end on the outer ſide, of a pale gray colour beneath, and brown black above, as is the reſt of the tail. The two exterior feathers on each ſide are of an extraordinary conſtruction, rather more than an inch wide at the baſe, and growing wider as they proceed to the ends, where they are full two inches broad and curve outwardly; the curved part is black with a narrow white border; the quills of theſe feathers are double for two thirds down from the rump. The general colour of the under ſides of theſe two feathers is of a pearly hue, elegantly marked on the inner web with bright rufous coloured creſcent-ſhaped ſpots, which, from the extraordinary conſtruction of the parts, appear wonderfully tranſparent, although at firſt ſight ſeemingly the darkeſt; they are alſo elongated into ſlender filaments of an inch or more, eſpecially towards the extremities.

The figure of the male, which accompanies this deſcription, was taken

taken from a ſpecimen ſent from New South Wales as a preſent to Lady Mary Howe. I have alſo ſeen two other ſpecimens in the poſſeſſion of the Right Hon. Sir Joſeph Banks, which I believe have ſince been depoſited in the Britiſh Muſæum.

SINCE I had the honour of communicating to the Linnean Society the foregoing deſcription of the *Menura*, I have been favoured with both male and female of that extraordinary bird from my friend Governor King, by the Buffalo ſtore-ſhip; and I am thereby enabled to lay before the Society a deſcription of the different ſexes. I find, indeed, that with a little deviation the ſame characters and colours will ſerve for both of them. The female, however, is ſomewhat ſmaller, being in length, from the crown of the head to the end of the tail, only 31 inches. The general plumage of the whole bird is of a dull blackiſh colour, a little rufous under the chin and throat, and of a browniſh caſt on the ſcapulars, as in the male. The plumage of the whole body, from the breaſt to the vent, and from the ſhoulders to the rump, is compoſed of long, ſlender, thread-like, ſilky feathers, reſembling fringe, of a dull grayiſh black; lighter on the breaſt, belly, and vent. The bill and legs, which are ſtrong and furniſhed with large ſcales, as in the cock, are black. From the head to the rump 14 inches. The tail 18 inches, alſo of a dull brown black colour above and gray beneath. The two upper tail feathers are ſharp pointed at the ends; the reſt are rounded and darker in colour, and ſhorten by degrees, as they approach the rump, ſo as to appear cuneated. The two outer feathers are ſhorter than the reſt, bent in form like thoſe of the male, brown black above, of a pearly gray beneath; and the creſcents, which are

of a deeper rufous colour, are not ſo viſible nor ſo large, but more tranſparent if poſſible, than thoſe of the cock. They are about an inch and a half broad, and not black or longer at the ends as in the other ſex.

From theſe birds being found in the hilly parts of the country, they are called by the inhabitants the Mountain Pheaſant. With reſpect to their food or manners I have not as yet obtained any particular account. In my ſpecimens, there is a nakedneſs round the eyes, but whether this is from the feathers having fallen off I know not. I rather think otherwiſe, and that it may be brightly coloured as in many other birds.

Blackheath,
19th June, 1801.

XVIII. *On the Doryanthes, a new Genus of Plants from New Holland, next akin to the Agave.*

By Joſeph Correa de Serra, LL.D. F.R.S. and L.S.

Read December 2, 1800.

AMONGST the various new and intereſting plants with which New Holland has of late enriched Botany, none perhaps has an equal claim to public notice with the plant which forms the ſubject of the preſent paper. Its beauty, its ſhape and elegance, and the tenacity of its vital powers, entitle it to particular attention both from the cultivator and the naturaliſt.

It was found in the mountainous part of the colony of New South Wales, by Mr. George Baſs, A.L.S. who brought the firſt ſpecimens of it laſt year to Europe, in the ſhip Perſeverance. Other ſpecimens, in a high ſtate of preſervation, have ſince been brought in ſpirits by Governor Hunter. From both theſe ſources, and a ſingle flower which came to perfection at Kew, from a portion of ſtem without roots, which had been cut many months before, in New Holland, the following deſcription of the genus has been made, and the character eſtabliſhed:

DORYANTHES*.

Flos.

Calyx nullus, niſi ſpathæ partiales.

* From the Greek Δορυ, *haſta*; Δορυανθης, *Haſta florida*.

Corolla monopetala, infundibuliformis, ſexpartita; laciniæ ſex, oblongo-lanceolatæ, concavæ, dorſo carinatæ, tres interiores baſi latiores.

Stamina. Filamenta ſex, longitudine fere petalorum, ſubulata, antherarum baſes profunde penetrantia; antheræ erectæ, ſubcylindricæ, biloculares, poſt fœcundationem extinctoriiformes.

Piſtillum. Stylus unicus (ex tribus connatis), triſulcatus, longitudine ſtaminum; ſtigma trilobum.

FRUCTUS.

Induviæ nullæ.

Pericarpium. Capſula turbinato-ovata, ſubtrigona, triſulcata, veſtigiis petalorum ſtylique coronata, trilocularis, trivalvis; ſubſtantia duplex: interior lignoſa, exterior corticoſa, ſtriata, fibroſa.

Placentatio. Chordulæ piſtillares ſex, per paria diſpoſitæ, axi diſſepimentorum affixæ. Semina chordulis piſtillaribus alternatim affixa, ut ſingula tantum ſeries in unoquoque loculo appareat.

Dehiſcentia duplex: per axim diſſepimentorum, et per valvarum ſuturas.

SEMEN LIBERUM.

Forma. Semen planum, reniforme, rugoſum. Nucleus lateralis, ſubtriqueter, dimidiam hujus partem obtinet.

Integumentum. Duplex; exterius ſpongioſum; nuclei cartilagineum.

Periſpermum. Amygdalinum, nucleo conforme.

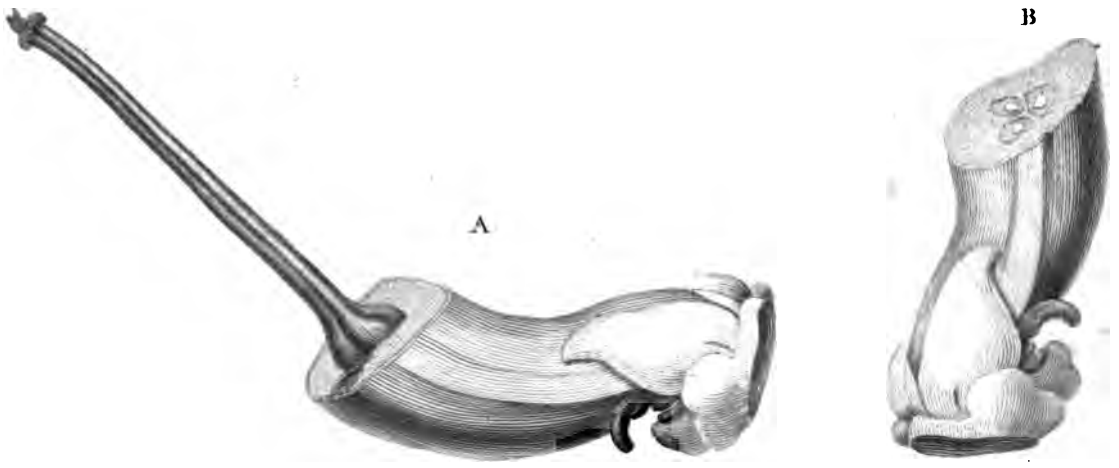
Embryo monocotyledoneus, minutus. Cotyledon foliaceo-compreſſa, plana, cuneiformis.

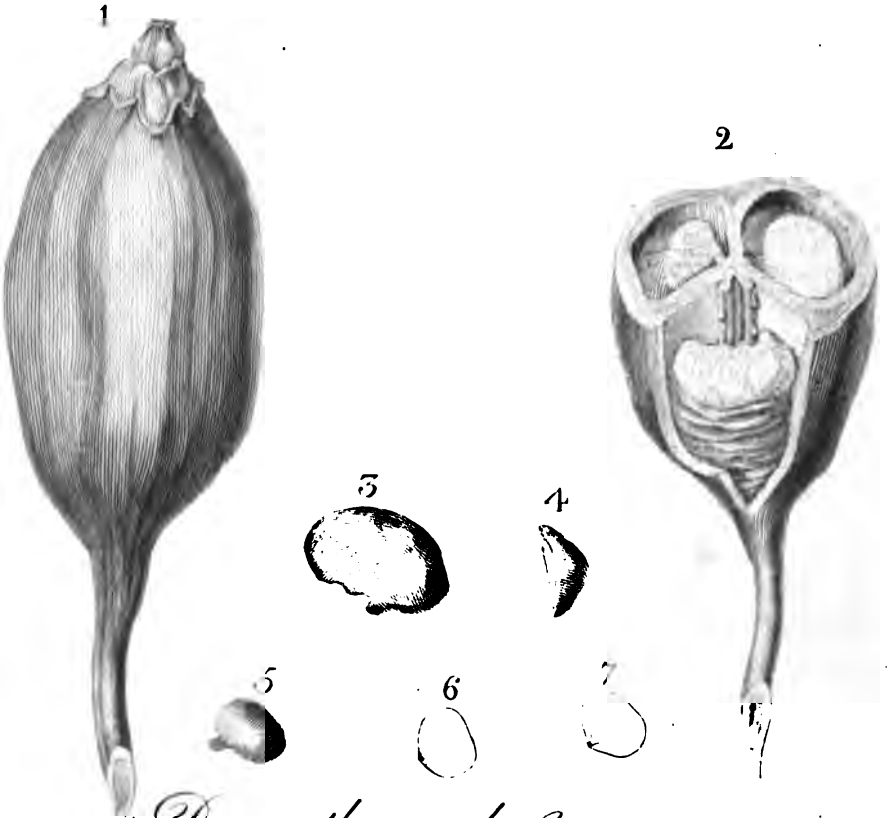
Obſervation 1. The *Agave*, *Fourcræa*, and *Doryanthes*, have a very ſtrict affinity. The antheræ, filaments, and the diſpoſition of ſeeds offer the greateſt differences. The antheræ in the *Agave* are *incumbentes*, in the *Fourcræa* the filaments are alated; the corolla *hexapetala*.

Doryanthes excelsa?

G. Queiroz Sculp.

Linn. trans. VI. Tab. 24 p. 213.





Doryanthes excelsa?

Quiroz Sculp.

hexapetala. The ſeeds in the *Agave* are ranged in two ſeries; in the *Doryanthes* they are diſpoſed as above, and the antheræ as deſcribed.

Obſerv. 2. The veſtiges of the corolla in the fruit perſuade me that the corolla is to be conſidered as *ſupera*, but the *traces* of the diviſions of petals, which may be remarked in the flower as far as the pedunculus, might perhaps induce a ſuſpicion that the fruit makes one body with the inferior part of the corolla, which by that means *in fructum abit.*

The loſtineſs of the ſtem of the only ſpecies hitherto known of this genus, which ariſes to the height of above 20 feet, may warrant the trivial name of *Doryanthes excelſa.*

REFERENCES TO THE PLATES.

Tab. XXIII.

Fig. 1. The whole flower.
2. Lacinia of the corolla with a filament.
3. Anthera extinctoriiformis, as it appears after the fœcundation.

Tab. XXIV.

Fig. A. Germen and piſtillum.
B. Horizontal ſection of the germen.
1. Capſula.
2. Horizontal ſection of the ſame.
3. Seed.
4. Section of the ſame.
5. Nucleus.
6. Naked ſeed.
7. Section of the ſame to ſhow the periſpermum and embryo.

XIX. *Obſer-*

XIX. *Observations on several Species of the Genus Apis, known by the Name of Humble-bees, and called Bombinatrices by Linnæus.*

By Mr. P. Huber, of Lausanne in Switzerland.

Read May 5, 1801.

Introduction.

On s'est intéressé de tous tems aux Abeilles; leur industrie a fait désirer de connoître leurs mœurs, et de profiter de leurs travaux; mais les Bourdons, moins utiles, ont aussi moins attiré les regards: ils ne sont connus que par les observations de Mr. de Réaumur; avant lui, des naturalistes peu exacts avoient fait une espèce de roman de leur histoire, mais il l'a purgée de tout le merveilleux, et il a sçu nous intéresser par le simple récit de faits dont il a été le témoin; on trouve un précis de ses observations dans la préface du sixième volume in octavo de son *Histoire des Insectes.*

Mr. de Réaumur ne donne pas une description assez détaillée de ces insectes, et les descriptions de Linné et de Géoffroi ne me paroissent pas même suffisantes pour distinguer les divers individus dont chaque famille de Bourdons est composée; j'ai essayé de les décrire, avec tous les détails propres à les faire reconnoître; j'ai même joint à mes descriptions des figures précieuses dont quelques uns de mes amis ont bien voulu enrichir ce mémoire.

Mr.

Mr. de Réaumur n'avoit pas vû ſur ce ſujet tout ce qu'il pouvoit offrir de curieux ; il avoit laiſſé un vaſte champ aux recherches des naturaliſtes ; il reſtoit à obſerver ſi le logement et le nid des Bourdons étoient toujours tels qu'il les avoit décrits, ſi ces inſectes n'habitoient jamais que des nids de mouſſe placés au-deſſus du terrain, et ſi le nombre des individus de chaque peuplade étoit limité, ou s'il ne l'étoit pas.

On pouvoit déſirer plus de détails que cet obſervateur n'en a donné ſur la cire qu'il a trouvé dans les nids des Bourdons, il étoit curieux de connoître la nature de cette matière, ſa formation, et ſes rapports avec la cire des Abeilles ?

Les notions que ce célébre naturaliſte nous a laiſſé ſur l'éducation des petits, n'étoient pas aſſez diſtinctes et aſſez détaillées pour ſatisfaire nôtre curioſité.

Il étoit à déſirer de ſavoir ſi les Bourdons n'avoient d'autres magazins que ce peu de reſervoirs dont parle Mr. de Réaumur, et s'ils tenoient leur miel dans des vaſes fermés ou dans des vaſes ouverts?

Pluſieurs traits curieux de l'induſtrie des Bourdons avoient encore échappé à Mr. de Réaumur; ſoit qu'il eût d'autres occupations quand il obſervoit ces inſectes, ſoit qu'il donnât alors trop peu d'importance à ces recherches. Mais depuis *les nouvelles obſervations ſur les Abeilles*, des problèmes intéreſſans devoient piquer la curioſité des naturaliſtes, il étoit important de ſavoir ſi l'on trouveroit chez les Bourdons, comme chez les Abeilles, cet attachement et ces ſoins des petits pour leur mère, s'ils feroient un cercle autour d'elle, et ſi lorsqu'ils la perdroient ils abandonneroient leur ruche ; ſi l'on trouveroit quelquefois pluſieurs femelles qui pondiſſent dans le même nid, et ſi l'on verroit parmi les ouvrières de ces mouches à demi fécondes dont tous les œufs donnent naiſſance à des mâles ; ſuppoſé que cela fût, il falloit encore ſavoir s'il y auroit quelque rivalité entre toutes ces mouches fécondes ; enfin ſi les mâles des Bourdons périſſoient, comme

ceux

ceux des Abeilles dans l'acte de la fécondation, & quelle pouvoit être la durée de la vie de ces inſectes.

Le déſir ardent de réſoudre des problèmes auſſi intéreſſants m'auroit ſeul déterminé à choiſir cette branche de l'hiſtoire naturelle, ſi cette étude n'avoit pas eu un autre attrait pour moi; car en me familiariſant avec des inſectes du genre des Abeilles, je pouvois ſeconder mon père dans ſa recherche favorite, et remplacer auprès de lui l'homme précieux que des circonſtances affligeantes lui avoient fait perdre.

C'eſt dans ces vues que je commençai au mois de Juin, 1796, à étudier les mœurs des Bourdons; on jugera par ce qui ſuit, de la manière dont j'ai rempli mon but, mais j'eſpère qu'on aura quelque indulgence pour le travail d'un naturaliſte de dix-neuf ans.

CHAPITRE I.

Déſcriptions de quelques Eſpèces de Bourdons.

LES Bourdons ont été rangés par les naturaliſtes dans la ſeconde famille du genre des Abeilles, autant peut-être par la conſidération de leurs mœurs et de leur induſtrie, que par celle de leur conformation.

Les Caractères de ce Genre ſont,

Deux *antennes* briſées, dont le premier anneau eſt très long.

Les *ailes* inférieures plus courtes que les ailes ſupérieures.

La bouche armée d'une machoire avec une trompe membraneuſe repliée en deſſous, l'aiguillon ſimple et en pointe.

Le ventre attaché au corcelet par un pédicule court.

Trois petits *yeux liſſes*.

Le *corps* velu.

Ce qui fait placer les Bourdons dans la ſeconde famille des Abeilles c'eſt le nombre et la longueur de leurs poils; mais ce caractère eſt ſi

peu ſolide qu'il étoit important d'en trouver un qui tint à la forme du corps, et fut à l'abri de tous les inconvéniens des couleurs.

Ce caractère, je crois l'avoir trouvé dans la forme de la tête.

Les Bourdons ont la tête proportionnellement plus alongée que les Abeilles; dans celles-ci elle eſt plus large que longue, ou du moins jamais plus longue que large; et dans les Bourdons, ſa longueur ſurpaſſe toujours ſa largeur.

Je vais paſſer à la déſcription de quelques caractères qui peuvent faire diſtinguer les Bourdons de différens ſexes dans la même eſpèce.

Déſcription des Caractères individuels.

Les entomologiſtes ont décrit près de 34* eſpèces de Bourdons, ou plutôt 34 de ces inſectes; mais leurs déſcriptions ne ſont pas auſſi complettes qu'on pourroit le déſirer.

Les Bourdons femelles, mâles, et ouvrières ne ſe reſſemblent pas toujours; et comme ces naturaliſtes ne ſe ſont pas expliqués ſur le ſexe des individus qu'ils décrivoient, on peut craindre qu'ils n'aient fait des claſſes différentes toutes les fois qu'ils auront trouvé des individus qui ne ſe reſſembloient pas.

Il y avoit cependant un moyen ſûr, de laiſſer chaque individu dans ſa famille, dans ſa place naturelle; il falloit les prendre dans leurs propres nids au mois d'Août ou de Septembre. C'eſt là qu'on devoit indubitablement trouver le mâle, la femelle, et l'ouvrière de la même eſpèce: on eut bientôt appris à reconnoître le mâle de l'ouvrière, et l'ouvrière d'avec la femelle; voici les caractères généraux auxquels on pouvoit les diſtinguer.

* Caroli Linnæi Entomologia Faunæ Suecicæ Deſcriptionibus aucta; D. D. Scopoli, Geoffroy, De Geer, Fabricii, Schrank, &c. ſpeciebus vel. in Syſtemate non enumeratis vel nuperrimè detectis, vel ſpeciebus Galliæ Auſtralis locupletata, generum ſpecierumque rariorum iconibus ornata; curante et augente Carolo de Villers. Lugduni 1789.

Les Mâles et les Femelles diffèrent

1. Par leur grandeur.
2. Par l'aiguillon.
3. Par la longueur des antennes.
4. Par le nombre de leurs anneaux.
5. Par la forme de la cinquième articulation de leurs jambes poſtérieures.
6. Par celle de leurs mandibules.
7. Par la longueur de leur trompe.

Premier caractère, *la Grandeur.*

Les mâles des Bourdons ſont tous plus petits que leurs femelles: la différence eſt plus ou moins grande ſelon les eſpèces: dans quelques-unes les femelles ſont au moins le double de leurs mâles, dans quelques autres elles ne les ſurpaſſent que de quelques lignes.

La grandeur des mâles et des femelles ne varie preſque pas dans chaque eſpèce, mais les ouvrières n'ont point une grandeur auſſi conſtante: les unes ſont ſi petites qu'on ne les prendroit pas pour des Bourdons: d'autres ſont ſi grandes qu'on ſeroit tenté de les prendre plutôt pour des femelles que pour des ouvrières: cependant leur taille n'égale jamais celle des mères, et un coup d'œil ſuffit pour les comparer, et les mettre chacune dans la place qu'elles doivent occuper.

Second caractère, *l'Aiguillon.*

L'aiguillon eſt placé à l'extrêmité du ventre des Bourdons et des Abeilles: il eſt long de deux ou trois lignes, et ſe meut avec beaucoup de vivacité par le moyen de huit muſcles, placés auprès de ſon origine: le dard qui paroit ſi délié à l'œil nud, eſt un petit tuyau creux, de matière de corne ou d'écaille; il contient l'aiguillon com-

poſé lui-même de deux dards accolés, qui jouent enſemble ou ſéparément ; leur extrêmité eſt taillée en ſcie dont les dents ſont tournées en fer de lance.

La veſſie à venin eſt à la racine de l'aiguillon. Lorſque ces mouches ſont irritées elles font ſortir la liqueur dont elle eſt remplie, pour la darder avec l'aiguillon dans la partie qu'elles veulent bleſſer.

Les mâles n'ont pas d'aiguillon, ce qui les rend inhabiles à défendre leur peuplade ; mais ce ſoin appartient aux femelles et aux ouvrières : elles font un uſage fréquent des armes qu'elles ont reçu, et ne perdent pas leur vie et leur aiguillon, comme cela arrive aux Abeilles lorſqu'elles s'en ſervent contre nous.

Leur piqueure eſt douloureuſe ; elle fait élever une petite ampoule ; mais le mal s'appaiſe et l'enflure diſparoit en fort peu de tems.

Si l'on enlêve le toit de mouſſe dont les Bourdons recouvrent leur nid, on entend d'abord les ouvrières et la mère battre des ailes vivement, et ce bruit aîgu eſt le ſigne de leur colère, ou de l'alarme qu'on leur cauſe ; on les voit alors venir ſur leurs gateaux avec agitation, lever une patte, puis une autre du même côté, puis la troiſième, et ſe renverſer tout-à-fait ſur le dos ; elles recourbent en haut leur anus, et préſentent à l'obſervateur indiſcret leur aiguillon, qui ſort accompagné d'une goutte de venin : quelquefois dans leur colère elles lancent cette liqueur, qui ne fait néanmoins aucun mal ſi elle n'eſt précédée d'une piqueure : le venin eſt cependant acide, puiſqu'il rougit les teintures bleues végétales.

Les Bourdons ſe tiennent ſur la défenſive juſqu'à ce qu'on les ait mis dans la néceſſité d'attaquer, par le dérangement de leur nid, ou par l'enlêvement de leurs petits ; alors l'obſervateur doit reſter ſans mouvement auprès du nid, les Bourdons s'appaiſent, et il peut avec de l'adreſſe viſiter leurs gateaux, et même les enlever avec tous leurs habitans.

Troiſième caractère, *les Antennes.*

Les antennes des Bourdons ſont compoſées de pluſieurs articles, dont le premier eſt fort long, le ſecond très court, tous les autres coniques excepté le dernier, qui eſt de la forme de la dernière articulation du doigt annulaire; il a peut-être cette forme à cauſe de ſon uſage; il paroit bien prouvé par les obſervations de mon père, que les antennes ſont les organes du tact chez les Abeilles, et j'ai vu les Guêpes, les Fourmis et les Bourdons s'en ſervir d'une manière analogue.

Les antennes des mâles ont treize articles, elles ſont beaucoup plus longues que la tête de ces inſectes; celles des femelles et des neutres ſont plus courtes en proportion; leur longueur n'excède pas celle de la tête, et elles ne ſont compoſées que de onze articles.

Quatrième caractère, *l'Abdomen.*

L'abdomen des femelles eſt compoſé de ſix anneaux, celui des mâles de ſept.

Les anneaux de l'abdomen des mâles peuvent ſe mouvoir avec une grande liberté; c'eſt ſurtout dans l'accouplement qu'on le remarque, parce qu'alors le mâle ſe cramponne ſur le corſelet de la femelle; et comme celle-ci eſt beaucoup plus grande que lui, l'accouplement ne pourroit pas ſe faire dans cette poſture, mais le mâle alonge ſon corps de près de trois lignes, il recourbe ſon dernier anneau contre l'anus de la femelle, y fait entrer les parties qui lui ſont propres, et l'accouplement s'opère.

Dans cet acte le mâle ne perd pas les organes de la génération, et la vie même, comme cela arrive au mâle de la Reine Abeille. Quand l'accouplement a duré une demi-heure, les inſectes ſe ſéparent: le mâle eſt quelquefois ſi ardent qu'il remonte ſur ſa femelle pour s'unir encore.

Le

Le cinquième caractère eſt tiré de la *forme d'une des articulations des jambes poſtérieures des Bourdons.*

La cinquième articulation des jambes poſtérieures de femelles eſt d'une forme triangulaire, large ordinairement d'une ligne et demi à ſon extrêmité inférieure, et beaucoup plus étroite à l'autre extrêmité; elle eſt garnie tout autour de poils longs, forts, très nombreux, et tournés en dehors; elle eſt deſtinée à ſervir de corbeille aux Bourdons lorſqu'ils vont ſur les fleurs, faire leur récolte de pouſſières d'étamines, ils en ont une à chacune de leurs jambes de la troiſième paire; ils les garniſſent de ces pouſſières à l'aide des pattes antérieures, et quand il les ont chargées l'une et l'autre également ils retournent à leur nid, où ces proviſions ſont dépoſées dans le magazin commun. La partie analogue dans les mâles eſt moins longue proportionnellement, beaucoup moins élargie à ſon extrêmité convexe, & entourée de poils courts foibles et peu nombreux; elle eſt entièrement incapable de ſervir aux mêmes uſages, mais auſſi les mâles ne ſont-ils point chargés de la récolte du pollen.

Sixième caractère, *les Mandibules.*

Les Bourdons ont plutôt des mandibules que des dents; car ils ne ſe ſervent que rarement de ces inſtrumens pour ſe nourrir, mais ils les employent à d'autres uſages, et leur forme nous fournira un caractère nouveau pour diſtinguer les mâles des femelles.

Les mandibules ou les dents des Bourdons ſont ajuſtées aux deux côtés du chaperon à la partie latérale de la tête; elles ſe meuvent de droite à gauche, et de gauche à droite, mais jamais de haut en bas comme nos machoires: elles ſe croiſent au devant de la tête, à laquelle elles donnent une forme triangulaire; elles ſont quelquefois un peu repliées au deſſous de la lêvre ſupérieure.

Celles des femelles ont une ligne de longueur; elles ſont preſque

en

en forme de cuillière, dentées à un bord, ſtriées, arquées, et creuſées intérieurement d'une manière très délicate.

Les mandibules des mâles ſont plates & minces, arrondies, & légèrement enfourchées à l'extrêmité, foibles, et bordées ſur le dos de barbes longues nombreuſes, réunies en pluſieurs faiſſeaux, et toutes tournées du côté de l'extrêmité des dents.

Les mandibules des ouvrières ſont ſemblables à celles des femelles; les unes et les autres ſont telles qu'elles doivent être pour couper et ciſeler la cire, pour arracher la mouſſe et les brins d'herbes dont ces inſectes compoſent le toit de leurs nids. Celles des mâles ſont trop foibles, trop embaraſſées de poils, et pas aſſez tranchantes pour couper la cire, et pour ſervir aux mêmes uſages que celles des ouvrières.

Septième caractère, *la Trompe.*

La trompe des femelles eſt plus longue que celle des mâles; la partie membraneuſe ou charnue de cet inſtrument m'a paru moins velue dans les mâles que dans les femelles.

Les étuis écailleux de la trompe ſervent quelquefois à écarter les obſtacles qui ſe préſentent à la recolte du miel, comme les étamines et les piſtils de certaines fleurs; d'autrefois cet uſage ſe fait remarquer d'une manière plus frappante. Je me ſouviens d'avoir vû de fort gros Bourdons eſſayer en vain de prendre le miel contenu dans des fleurs de fêves; la groſſeur de leur tête et celle de leur corſelet les empêchoit d'entrer aſſez avant dans les longs tubes de ces fleurs; mais ces inſectes alloient droit au calice; ils le perçoient, ainſi que le tube, avec la partie écailleuſe de leur trompe; la partie membraneuſe de cet inſtrument, ou la trompe proprement dite, pénétroit alors juſqu'au ſein de la fleur, y trouvoit les nectaires, et en enlevoit le miel dont ils étoient remplis. Ces inſectes alloient ainſi de fleurs en fleurs perçant leurs tubes par dehors, et ſuçant le nectaire, tandis

dis que d'autres Bourdons plus petits, ou dont les trompes étoient plus longues, entroient dans la corolle, pénétroient dans le tube, et atteignoient le miel ſans la déchirer.

Les ſemences contenues dans leur ſilique ne ſouffroient point de la bleſſure faite au calice et à la corolle de ces fleurs, et les fêves qui en provenoient ne paroiſſoient pas différentes des autres fêves.

J'ai vu des Bourdons de la même eſpèce ouvrir avec leurs dents les tubes de l'ancolie à leur baſe, & chercher de la même manière le miel dans ſes nectaires.

Je joins ici une déſcription particulière de tous les Bourdons que j'ai trouvé dans les environs de Lauſanne, et que j'ai pris dans leur nid ; ils ont tous été peints d'après nature ; je n'ai ſuivi aucun ordre dans la place que je leur ai donnée dans mes déſcriptions ; elle étoit indifférente.

CARACTERES SPECIFIQUES.

ESPECE I.*

TAB. XXV. Fig. 1—3.

La FEMELLE. Sa tête, ſon corſelet, & les trois premiers anneaux de ſon abdomen ſont noirs ; les trois derniers ſont écarlate ; la broſſe de ſes jambes poſtérieures eſt dorée ; ſes ailes ſont ſans couleurs ; le deſſous de ſon corps et de ſon corſelet eſt noir. Fig. 1.

Le MALE diffère de la femelle par deux mouchets de poils verds, l'un au deſſus, l'autre au devant de la tête ; par une bande de poils verds qui borde le corſelet du côté de la tête, et qui paſſe le long de ſon cou juſqu'au deſſous du corſelet, où elle s'étend entre les jambes, & par une autre bande verte qui borde antérieurement l'abdomen. Le deſſous du corps, qui eſt entièrement verd ; les poils de

* Apis lapidaria *Linn.*

la

la même couleur qui bordent les premières articulations des jambes antérieures; les jambes poſtérieures bordées de poils écarlates, ſont encore autant de ſignes auquels on peut recourir pour reconnoître les mâles entre les femelles et les ouvrières; ils ſont d'un tiers plus petits que les femelles. Fig. 2.

L'OUVRIERE, ou l'individu neutre, reſſemble en petit à la femelle, mais ſes pattes poſtérieures ne ſont point dorées; la grandeur moyenne des ouvrières eſt un peu inférieure à celle des mâles. Fig. 3.

OBSERVATIONS. Ces Bourdons habitent ſous terre à une plus grande profondeur que tous les autres; ils y ſont très nombreux: ils ſe logent cependant quelquefois à la ſurface du ſol; alors leur famille eſt au plus compoſée d'une vingtaine d'individus; les femelles y naiſſent plutôt que dans les nids profonds, & les mâles ont des couleurs moins vives: ſeroit-ce une variété? Dans les uns et les autres ils naiſſent plutôt que les femelles. Ces Bourdons ſont communs dans les plains ſeches et ſur les collines.

ESPECE II.

TAB. XXV. Fig. 4—6.

La FEMELLE. Sa tête eſt noire; ſon corſelet de la même couleur, mais verdâtre antérieurement; l'abdomen noir; les quatre derniers anneaux brun-rouges; ſon corps, ſon corſelet ſont noirs en deſſous; ſes couleurs ſont moins vives que dans l'eſpèce précédente, ſes ailes plus brunes, et ſa taille inférieure. Fig. 4.

Le MALE. Il porte une couronne de poils verds ſombres ou quelquefois gris ſur un torax noir; le premier anneau eſt gris blanc, le ſecond fauve, les cinq derniers bruns rouge; il diffère auſſi de la femelle par le deſſous de ſon corps, qui eſt couvert d'un duvet brun;

brun ; par ſes jambes poſtérieures dorées, et par ſes ailes, qui ſont moins brunes. Fig. 5.

NEUTRE. L'ouvrière diffère de la femelle par une petite couronne de poils d'un verd ſombre et très foncé ſur le thorax : les trois premiers anneaux de l'abdomen ſont couleur de maron, les trois derniers à peu près comme dans la femelle ; le reſte de même. Fig. 6.

OBSERVATIONS. Ces Bourdons vivent ſous terre. Les peuplades de cette eſpèce que j'ai poſſédé n'étoient pas conſidérables ; les mâles y nâquirent au commencement d'Août, et les grandes femelles au commencement de Septembre.

ESPECE III.*

TAB. XXV. Fig. 7—9.

La FEMELLE. La tête et le corſelet ſont noirs : le corſelet porte une bande jaune antérieurement. Le premier anneau de l'abdomen eſt noir, le ſecond citron, le troiſième noir, et les trois derniers blancs ; les ailes ſont fort brunes, la broſſe eſt dorée. Fig. 7.

Le MALE reſſemble parfaitement à la femelle, à l'exception de ſes pattes poſtérieures, qui ne ſont point dorées ; il eſt auſſi beaucoup plus petit. Fig. 8.

L'OUVRIERE. Ne diffère de la femelle que par l'infériorité de ſa taille, par le 4me anneau de ſon corps, qui eſt noir, et par ſes pattes, qui ne ſont pas dorées. Fig. 9.

OBSERVATIONS. Ces Bourdons ſont fort communs ſur les fleurs ; ils font leurs nids en terre à la profondeur d'un pied ou d'un pied et demi ; la population de quelques-unes de leurs ruches peut aller à

* Apis terreſtris *Linn.*

2 ou 300 individus. Les mâles et les femelles paroiſſent dans leurs nids au mois de Juillet. Cette eſpèce de Bourdons eſt remarquable par la grandeur, la force, l'activité et la vigilance des femelles et des ouvrières. L'ouvrière repréſentée dans la figure a été choiſie parmi les plus petites, pour faire voir combien elles peuvent être petites quelquefois; leur taille ordinaire eſt à peu près celle du mâle dépeint. Ces inſectes volent avec rapidité et avec grand bruit, à cauſe de la largeur de leurs ailes.

ESPECE IV.*

TAB. XXV. Fig. 10—12.

La FEMELLE. La tête noire; le thorax noir, chargé d'une couronne de poils jaunes interrompue à l'origine des ailes; l'abdomen, dont le premier anneau, eſt jaune, le ſecond et le troiſième noirs, les autres blancs, eſt d'une forme étroite alongée; la broſſe des jambes poſtérieures eſt dorée, les ailes très-brunes. Cette femelle eſt un peu moins grande que la précédente. Fig. 10.

Le MALE reſſemble à tous égards à la femelle, excepté par ſon dernier anneau, qui eſt noir, et par ſes jambes non dorées; il eſt auſſi plus petit que la femelle. Fig. 11.†

L'OUVRIERE ne diffère de la femelle que par ſes pattes nullement dorées; elle eſt à-peu-près de la taille du mâle. Fig. 12.

OBSERVATIONS. Ces Bourdons ainſi que les précédens ornent in-

* Apis hortorum *Linn.* A. ruderata *Fab.*

† Les trois demi-anneaux inférieurs, qui répondent aux trois demi-anneaux blancs du deſſus de l'abdomen, ſont quelquefois jaunes, et les autres noirs; il n'en eſt pas ainſi de la femelle et de l'ouvrière.

finiment

finiment les prairies par l'éclat de leurs couleurs; ils volent avec bruit, et ſont fort attachés à leur peuplade. Celles-ci ſont logées en terre; elles ſont moins nombreuſes et moins fortes que celles du *terreſtris*. Les mâles et les femelles naiſſent à la fin du mois d'Août et au commencement de Septembre; ils ſont cependant fort rares alors dans les prairies; les individus ſont preſque toujours de la grandeur de ceux que j'ai fait peindre.

ESPECE V.

TAB. XXV. Fig. 13—15.

La FEMELLE. La tête eſt ornée de touffes de poils d'un verd jaunâtre très pâle, ſur le front et ſur le crane; le corſelet noir porte une couronne d'un verd jaunâtre, qui s'étend au deſſous des ailes et des jambes; les deux premiers anneaux de l'abdomen ſont d'un blond cendré: le troiſième eſt noir; les trois derniers ſont d'un roux clair, & bordés de poils jaunes. Cette femelle eſt ordinairement plus petite que celles des eſpèces précédentes. Fig. 13.

Le MALE, plus petit que la femelle, n'en diffère que par les deux premiers anneaux de ſon corps, qui ſont fauves. Fig. 14.

L'OUVRIERE diffère de la femelle en ce que les deux premiers anneaux de ſon abdomen ſont d'un verd clair; le troiſième eſt noir, et bordé de poils d'un verd foncé. Elle eſt a peu près de la grandeur du mâle. Fig. 15.

OBSERVATIONS. Le mâle eſt ordinairement plus gros qu'il n'eſt repréſenté dans la figure. On trouve les mâles et les femelles aux mois d'Août et de Septembre. Leurs peuplades ſont enterrées à une petite profondeur, et ne ſont pas très conſidérables.

ESPECE VI.*

TAB. XXV. Fig. 16—18.

La FEMELLE. Dans cette eſpèce la femelle eſt plus petite que dans toutes les autres : elle a des poils jaunes ſur le ſommet de la tête, et blancs ſur le front, une touffe de poils d'un jaune doré ſur le thorax, et entre les jambes d'un jaune verdâtre ; le premier anneau de l'abdomen eſt d'un blanc jaunâtre, les autres d'un verd pâle et tirant ſur le jaune ; les pattes ſont couvertes de poils blanchâtres, la broſſe dorée, et les ailes fort brunes. Fig. 16.

Le MALE a la tête comme la femelle ; le corſelet à peu près ſemblable, excepté qu'il eſt moins doré au deſſus, et que les poils des bords et du deſſous ſont blancs ; mais l'abdomen en diffère beaucoup plus ; le premier anneau eſt blanchâtre, le ſecond et le troiſième ont une nuance de verd ; les quatrième et cinquième bruniſſent un peu ; les derniers ſont d'un roux légèrement doré. Fig. 17.

L'OUVRIERE a la tête et le corſelet à peu près comme la femelle ; les trois premiers anneaux ſont couverts de poils bruns ; les trois derniers de poils d'un jaune verdâtre ; la broſſet dorée. Fig. 18.

OBSERVATIONS. Ces Bourdons ont été appellés par les naturaliſtes *Bourdons de la mouſſe* ; en effet, on les trouve preſque toujours dans les prés, cachés ſous un petit toit de mouſſe, qui s'élève au deſſus du ſol, de 5 à 6 pouces ; leur nid eſt cependant dans un petit creux. Leurs peuplades ſont peu nombreuſes ; ils ſont d'une humeur fort pacifique.

* Apis Muſcorum *Linn.*

ESPECE VII.

La FEMELLE. Le corſelet eſt noir, et bordé antérieurement d'une large bande jaune pâle; les deux premiers anneaux ſont noirs, les 3me et 4me blancs, et les autres noirs.

Le MALE. Son corſelet eſt noir et bordé de verd; le premier anneau de ſon corps eſt recouvert de poils noirs et verds; le ſecond et le troiſième ſont noirs; les quatrième et cinquième ſont verds; les ſixième et ſeptième ſont noirs bordés à l'éxtrêmité de poils rouſſâtres.

NOTE. Lors que je fis la déſcription de ces deux inſectes, je ne ſongeai point à la néceſſité de décrire auſſi l'ouvrière; je ne l'ai pas retrouvée depuis lors; je ne fis pas non plus deſſiner les individus décrits, mais je n'ai pas cru devoir pour cela negliger de placer enſemble deux individus que j'ai vu accouplés, et qui ſont ſi différens qu'on ne les croiroit pas de la même famille.

ESPECE VIII.

TAB. XXV. Fig. 19—21.

LA FEMELLE. Le corſelet de cette femelle eſt noir, bordé antérieurement d'une bande verte foncée et très diſtincte; ſon corps eſt noir; les trois derniers anneaux ſont noirs, et bordés antérieurement de poils écarlates; ſes ailes ſont noires, les jambes noires. Fig. 19.

LE MALE a la tête noire; le corſelet noir, portant une petite couronne verte qui eſt très ſenſible du coté de la tête; les trois premiers anneaux de ſon corps ſont noirs, bordés antérieurement de poils

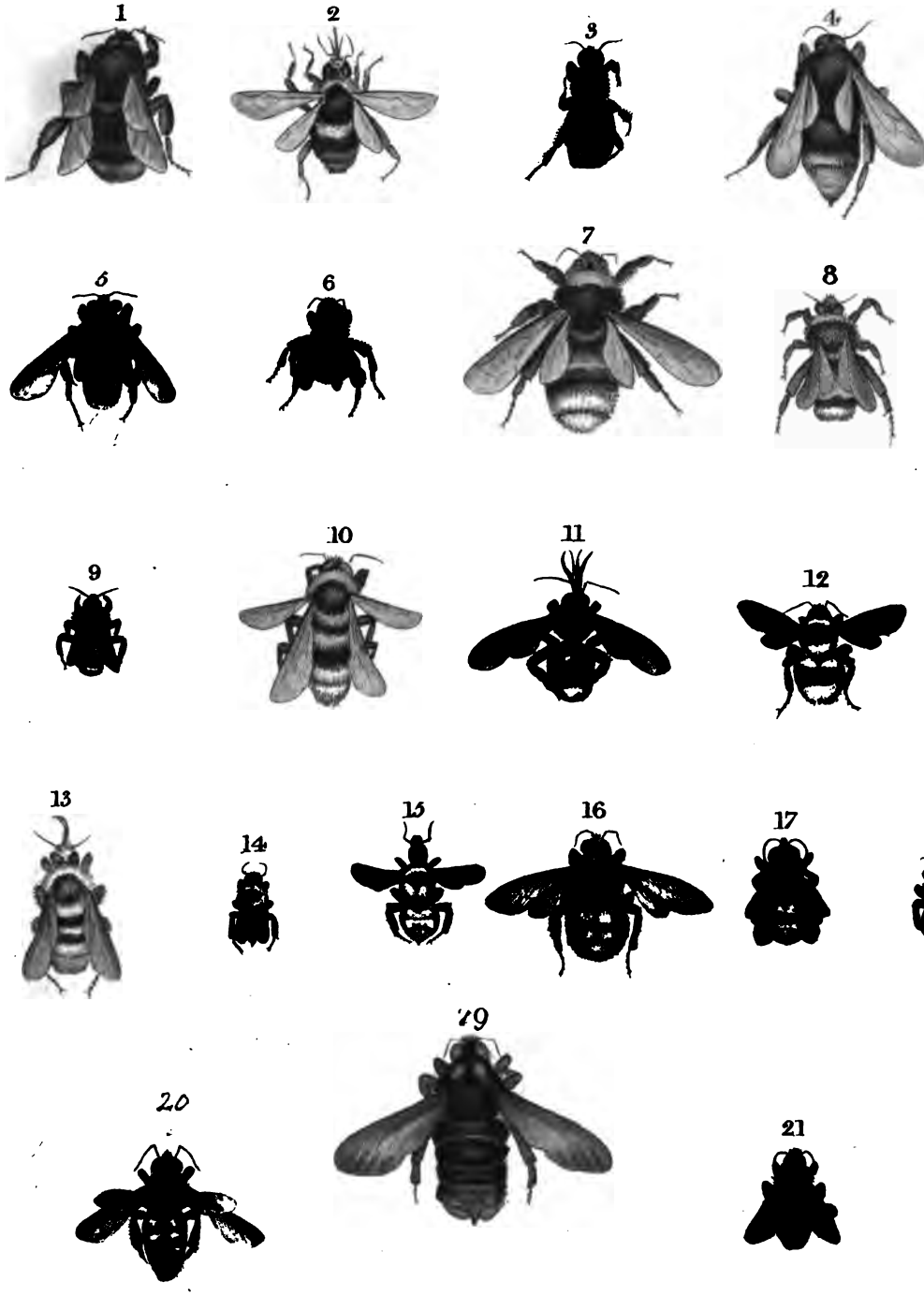
poils verds ; les quatre derniers ſont couleur d'or ; toutes ſes pattes ſont dorées à l'extrêmité, ſes ailes ſont beaucoup moins brunes que celles de la femelle. Fig. 20.

L'OUVRIERE reſſemble parfaitement à celle de la première eſpèce ; ſes ailes ſont ſeulement un peu plus brunes ; les pattes ne ſont point dorées : elle diffère de la femelle en ce qu'elle n'a point de bande verte ſur le devant du thorax. Fig. 21.

OBSERVATIONS. La femelle de cette eſpèce eſt d'une grande taille ; ſes écailles ſont d'un noir très foncé ; le mâle eſt le ſeul de tous les Bourdons ci-deſſus dont toutes les jambes ſoient dorées ; il diffère eſſentiellement de ceux de la première et ſeconde eſpèce à cauſe des poils verds repandus ſur ſes trois premiers anneaux ; ces inſectes vivent ſous terre, à la profondeur d'un pied. Les mâles et les femelles naiſſent vers le milieu de Juillet.

Je pourrois aiſément donner la déſcription d'un plus grand nombre d'eſpèces ; mais mon but n'étoit que d'indiquer la manière dont il ſeroit à déſirer qu'on décrivit les inſectes qui comptent parmi eux des individus neutres et différens, comme quelques Abeilles, les Guêpes, les Frelons, les Fourmis et d'autres Bourdons.

J'ai cherché longtems des caractères qui puſſent diſtinguer les Bourdons entr'eux, et qui fuſſent à l'abri des inconvéniens attachés aux couleurs et aux poils ; mais j'ai été forcé de recourir à ces mêmes poils, comme la ſeule partie de leur corps qui offrit quelque différence facile à ſaiſir. Des obſervations de trois années m'ont appris que les caractères tirés des poils étoient très peu ſolides ; et je crois devoir avertir les naturaliſtes que les Bourdons perdent leur éclat, leur luſtre et leur couleur : et qu'ils griſonnent en vieilliſſant comme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comme les grands animaux. Les poils des Bourdons noirs et écarlates paſſent du noir au gris, de l'écarlate au jaune ou même au blanc; & les mâles, dont les couleurs ſont ſi brillantes, les perdent en partie. Les Bourdons jaunes, blancs, et noirs deviennent quelquefois noirs et blancs par l'affoibliſſement graduel de la couleur des bandes jaunes dont ils ſont ornés.

Un plus grand écueil encore pour les naturaliſtes, c'eſt la perte des poils mêmes, qui pourroit les induire à prendre pour de nouvelles eſpèces des individus ſeulement mutilés; car l'épaiſſeur plus ou moins grande de ces poils, au travers deſquels on apperçoit d'autant mieux les écailles de l'animal qu'ils ſont plus rares, donne lieu à des nuances nouvelles, et qui m'ont quelquefois trompé, malgré les ſoins particuliers que j'ai mis à ſavoir les diſtinguer.

Ainſi, dans les Bourdons de la mouſſe, leur corps d'un jaune verdâtre devient brun au bout de quelque tems; d'autres Bourdons perdent les poils de leur corſelet, et laiſſent le diſque ſupérieur parfaitement à nud; quelquefois tous les poils de leur abdomen tombent, et l'on ne voit plus qu'un corps noir et écailleux, là où des belles bandes jaunes ſe faiſoient précédemment remarquer par leur éclat. Je conſerve dans ma collection une femelle qui n'a plus que deux mouchets de poils rouges ſur les derniers anneaux de ſon abdomen; elle eſt d'ailleurs parfaitement raſe; j'en ai vû d'autres entièrement depourvus de poils: la calvitie des Bourbons ſeroit encore bien plus importante à reconnoître, ſi la forme de leur tête ne pouvoit offrir un caractère qui les diſtingue des autres Abeilles.

Ces inſectes ſont ſujets à divers accidens; quelques-uns d'entr'eux ſont remarquables par des mouchets de poils blancs placés irrégulièrement ſur leur abdomen, au milieu de leurs poils noirs; d'autres ont ſur leur corps un mouchet de poils écarlates vraiment accidentels, car leurs petits ne participent point à ces irrégularités. On

trouve encore dans les nids des Bourdons des individus mutilés; celui-ci vient de naître, et ſes ailes, au lieu de ſe développer, ſe tordent et ſe deſſéchent; celui-la périt parceque ſa trompe eſt mal conſtruite, et qu'il ne peut en faire uſage; un troiſième eſt ſorti de ſes enveloppes avant l'âge preſcrit par la nature; ſes membres n'ont pas acquis toute leur conſiſtence; quelques parties des jambes ſont reſtées blanches ainſi que les yeux; la trompe mal développée ne peut fournir à l'inſecte la nourriture dont il a beſoin; il meurt.

J'ai remarqué un fait analogue chez les fourmis de pluſieurs eſpèces; leurs femelles naiſſent ailées ainſi que leurs mâles; quelque tems après leurs amours les mâles périſſent; mais les femelles ſubſiſtent, et toutes perdent leurs aîles très peu de jours après; qu'on fouille alors leur nid juſqu'au fond, on ne trouvera pas un inſecte ailé; je ne ſais pas exactement le nombre de jours au bout deſquels elles ſont ainſi mutilées, mais je crois que ce n'eſt pas plus d'un mois après l'accouplement *.

CHAPITRE II.

Des Cavités ſouterraines dans leſquelles on trouve les Nids de Bourdons.

LES Bourdons ſont des inſectes ovipares; ils pondent leurs œufs dans une cellule d'une cire particulière, qu'ils conſtruiſent dans une cavité ſouterraine; il ſort de ces œufs autant de petits vers; ils y ſont nourris et ſoignés par une mère qui veille dabord ſeule à leur ſureté et à leur conſervation; ils groſſiſſent de jours en jours; ils ſe filent un coque de ſoie, ainſi que les vers des Abeilles; quelques jours leur ſuffiſent pour ſe transformer en nymphe; ils demeurent immo-

* Ce fait a été vû par Mr. Latreille.

biles

biles juſqu'au moment où ils doivent déchirer toutes leurs enveloppes, et ſe montrer ſur le nid comme les autres Bourdons; alors leurs ailes ſe déployent, tout leur corps eſt ſemé de poils, qui prennent bientôt les couleurs les plus variées; ils commencent à aider leur mère dans ſes travaux avec une addreſſe qui ne le cède pas à la ſienne.

Je ne ſais point ſi Mr. de Réaumur a obſervé les Bourdons qui habitent les creux ſouterrains; mais il n'a pas écrit l'hiſtoire de ces inſectes, et l'on ne trouve rien dans ſes mémoires ſur la profondeur à laquelle ils fixent leur habitation, ſur la forme et les dimenſions de la cavité qui doit receler leur nid, ni ſur les chemins qui y conduiſent; il dit ſeulement qu'il a vû fort ſouvent des femelles de Bourdons qui travailloient avec une grande activité à creuſer en terre des trous très profonds; leurs dents détachoient des brins de terre; les premières jambes s'en ſaiſiſſoient, et les pouſſoient au devant des ſecondes; celles de la troiſième paire les recevoient à leur tour, et les pouſſoient en arrière auſſi loin qu'il leur étoit poſſible.

Il paroit que ces femelles ſondoient le terrain; elles auroient probablement approfondi ces trous, et prolongé leurs galeries ſouterraines ſi quelque obſtacle ne s'y fut oppoſé; mais celles qui les avoient ébauché avec beaucoup de travail, et qui y avoient employé pluſieurs heures, les abandonnoient ſans les percer au delà d'un pouce ou deux, et alloient en conſtruire d'autres tout auprès. Mais Mr. de Réaumur ne les vit jamais prolonger ces galeries, ni commencer aucun nid dans l'eſpace que pluſieurs d'entr'elles avoient creuſé ſéparément ſous ſes yeux. On croiroit même qu'il n'a pas ſoupçonné que certains Bourdons habitoient des cavités ſouterraines; ſon obſervation, toute incomplette qu'elle eſt, prouve que ces inſectes ont été inſtruits à creuſer des ſouterrains, et peut nous donner l'idée de la manière dont ils les excavent.

Géoffroy parle des Abeilles Bourdons dans ſon *Hiſtoire abrégée des Inſectes*; voici ce qu'on lit à la page 404 du ſecond volume de ſes œuvres:

" C'eſt ſous la terre que travaillent les Bourdons, et ſurtout ſous les gazons dont les racines liant la terre forment une voûte plus ſolide au ſouterrain que pratiquent ces inſectes. On en voit un nombre conſidérable voltiger ſur les gazons; on n'a qu'à les ſuivre, on appercevra un endroit où ils diſparoiſſent, et en regardant de près on découvrira l'ouverture de leur habitation. S'ils ne font que la commencer, tous ces inſectes ſeront occupés à fouir la terre et à tranſporter dehors les molécules qu'ils en détachent. Les trous qu'ils pratiquent ſont vaſtes et ſpacieux, auſſi beaucoup d'inſectes ſe mettent-ils à l'ouvrage, car ces Abeilles vivent en ſociété comme les Abeilles domeſtiques."

Les Bourdons que j'ai obſervé habitoient auſſi ſous terre; on trouvoit leur nid à la profondeur d'un ou deux pieds; le chemin qui y conduiſoit étoit quelquefois long et tortueux; le nid étoit dans une cavité aſſez conſidérable, d'une forme voutée, plus large que haute; elle étoit tapiſſée de feuilles dans le fond, et le gateau étoit poſé délicatement ſur un lit de cette matière.

Quelquefois les femelles de ces Bourdons qui habitent ſous terre établiſſent leur nid à la ſurface du terrain; elles le font dans un petit creux tout ouvert par deſſus; elles ſavent le couvrir avec de la mouſſe, et ſont inſtruites à le tapiſſer en dedans avec de la même matière; ce n'eſt cependant pas là leur logement naturel, car leurs familles y ſont peu nombreuſes, tandis qu'elles le ſont beaucoup plus, lorſqu'elles les fixent dans des cavités dont l'abord eſt plus difficile pour les inſectes qu'elles ont à craindre; leurs petits y ſont auſſi moins à l'abri des injures du tems, et de toute eſpèce d'accidens.

Idées

Idées ſur la Formation de la Cavité ſouterraine que les Bourdons habitent ordinairement.

L'excavation de cette cavité ſouterraine et du chemin qui y conduit, n'eſt point, comme le penſoit Géoffroy, le réſultat du travail de toute une famille de Bourdons; le nid lui-même n'eſt pas l'ouvrage d'un peuple nombreux.

Une femelle ſolitaire a choiſi et préparé ce logement au commencement du printems; elle a poſé les fondemens des gâteaux, et elle n'a pû être aidée dans ſon travail, que lorſque ſes petits ſont parvenus à l'état de perfection.

Je n'ai point vû de quelle manière elle creuſoit le chemin qui aboutit à ſon nid; je ne ſais pas mieux comment elle forme la voûte ſous laquelle elle a établi les fondemens de ſes gâteaux. On ignore même ſi elle creuſe toujours cette voûte, ou ſi elle ne profite point dans certaines occaſions de quelques trous faits par des taupes, ou par d'autres animaux; le hazard ſeul peut mettre ſous les yeux de l'obſervateur une femelle creuſant la galerie qui doit conduire à ſon nid.

Il ne ſeroit peut-être pas impoſſible d'obliger une femelle de Bourdon à travailler en terre.

On lui donneroit pour habitation un cabinet bien expoſé au ſoleil, et fermé de toutes parts.

On mettroit à ſa portée des vaſes de fleurs, où elle pourroit recueillir, comme dans un parterre, tous les ingrédiens néceſſaires à l'exécution de ſes travaux; elle trouveroit dans les vaſes une terre facile à miner; on la verroit peut-être commencer à eſcaver la galerie dont j'ai parlé: après avoir ſuivi ce travail, on ne trouveroit pas de difficulté à concevoir comment elle prépare, comment elle évide la cavité ſouterraine.

Si elle ſe refuſoit à miner la terre, on pourroit eſſayer de lui pré-

parer quelques trous ſemblables à ceux des taupes: ce ne ſeroit pas à la vérité le moyen de voir comment elle creuſe ſon logement; mais ſi elle profitoit de ces trous, on pourroit ſoupçonner que dans l'état naturel elle ſe ſert auſſi quelquefois des cavités qu'elle trouve toutes faites, et qu'elle eſt diſpenſée de la peine de les creuſer.

Quelques obſervations viendroient alors appuyer le jugement du naturaliſte.

Il ſauroit qu'on voit dès le commencement d'Avril les femelles de Bourdons errer çà et là dans les prairies, entrer dans tous les trous qu'elles apperçoivent, les uns après les autres, comme pour choiſir celui qui leur conviendra le mieux.

Elles font ce manège pendant tout le courant de ce mois; elles ſemblent alors plus inquietes de trouver des cavités ſouterraines qu'occupées à chercher du miel ſur les fleurs.

J'aurois déſiré pouvoir raconter de quelle manière les jeunes femelles poſent les fondemens de leurs gâteaux, comment elles élèvent leurs petits dans la ſolitude, et quel eſt leur genre de vie pendant le tems où elles ſont iſolées; mais ce n'eſt que du hazard, comme je l'ai dit, que l'on doit attendre l'occaſion de voir ce qui ſe paſſe alors dans un nid de Bourdons; à quel ſigne pourroit-on en effet reconnoître l'exiſtence d'une cavité ſouterraine à laquelle on n'aboutit qu'au moyen d'un canal étroit, tortueux, et plus ou moins long, lorſqu'aucun de ſes habitans ne voltige à l'entour de ſon entrée.

Je ne perds point l'eſpérance de le voir un jour; mais en attendant je me permettrai quelques conjectures qui ſont fondées ſur mes obſervations; et afin qu'on puiſſe juger de leur vraiſemblance, j'expoſerai ici ce que j'ai vû dans les nids de Bourdons, pris au mois de Juin au fond de leur cavité ſouterraine, et placés enſuite ſous des cloches de verre.

CHAPITRE

CHAPITRE III.

Déſcription des Nids des Bourdons qui vivent ſous Terre.

LES Bourdons dont Monſieur de Réaumur a écrit l'hiſtoire, ne ſont pas exactement de la même eſpèce que ceux dont je me ſuis occupé. Les prémiers habitent preſque à la ſurface de la terre, et conſtruiſent leur nid avec de la mouſſe, comme cet obſervateur le décrit dans ſon mémoire. Ceux qui m'ont occupé pendant l'été dernier habitoient quelquefois à un ou deux pieds au deſſous de la ſurface du ſol; un long canal oblique ou perpendiculaire au terrain, ſervoit de galerie aux Bourdons qui revenoient au nid. Ce conduit pouvoit avoir un demi-pouce de diamêtre; il étoit cylindrique, quelquefois jonché de feuilles sèches et de menu foin; c'eſt au milieu de ces matériaux qu'on trouvoit le nid des Bourdons, recouvert d'une calotte de cire, qui s'élevoit d'abord comme un mur autour du nid, et qui s'arrondiſſoit par deſſus en ſuivant les gâteaux à la diſtance de 4 à 5 lignes. TAB. XXVI. Fig. 1.

Après avoir enlevé cette enveloppe de cire, on étoit frappé de l'apparente groſſiereté de l'ouvrage qu'elle renfermoit; c'étoient des maſſes de corps ovoïdes d'un jaune plus ou moins pâle et d'une groſſeur différente; les uns avoient 6 lignes de longueur et 4 de largeur, les autres en avoient 4 dans leur plus grande dimenſion, et $2\frac{1}{2}$ dans la plus petite; leur plus grand diamêtre étoit ordinairement vertical. Si l'on obſervoit avec plus d'attention on découvroit qu'un petit nombre de ces corps ovoïdes formoient, en ſe réuniſſant, un groupe dont toutes les parties étoient ſolidement liées enſemble; que les corps oblongs qui occupoient le milieu de ces groupes étoient plus élevés que ceux qui les entouroient, et que ceux-ci dominoient encore ceux qui formoient un troiſième rang.

On ne voyoit la plûpart du tems que le ſommet de ces corps ovoïdes,

ovoïdes, parceque leurs baſes étoient cachées dans le centre du groupe. TAB. XXVI. Fig. 2. Les dimenſions ordinaires d'un groupe étoient d'un pouce et demi dans ſa hauteur et de deux dans ſa largeur.

Un certain nombre de ces groupes à peu près ſemblables, placés les uns à côté des autres, dans un plan horizontal, et unis légèrement enſemble par de petits liens de cire, formoient un eſpèce de gâteau, dont le deſſus étoit convexe, et le deſſous légèrement concave.

Pluſieurs gâteaux de ce genre étoient poſés les uns au deſſus des autres; l'irrégularité de leurs ſurfaces, et les vides que laiſſoient entr'eux les corps ovoïdes dont il a été parlé, permettoient aux Bourdons de les parcourir en tout tems. Chacun de ces gâteaux étoit ſupporté par les ſommités les plus élevées des corps oblongs de l'étage inférieur; ils étoient outre celà liés enſemble par des pilliers de cire longs de 2 ou 3 lignes, qui alloient d'un étage à l'autre, et qui étoient moins épais dans leur milieu qu'ils ne l'étoient à leur baſe et à leur ſommet.

Les corps ovoïdes qui formoient la maſſe des gâteaux n'étoient autre choſe que des coques d'une ſoie forte et bien collée; elles contenoient des Bourdons dans l'état de nymphe, ou des larves prêtes à ſe transformer (TAB. XXVII. Fig. 1. a & b.); toutes les coques des gâteaux inférieurs étoient ouvertes et tronquées à leur extrêmité ſupérieure, parceque les nymphes qui les avoient habitées s'étoient transformées en Bourdons, et s'étoient fait une ouverture au ſommet de la coque pour jouïr de leur liberté, tandis que les coques du gâteau ſupérieur étoient encore fermées, et conſervoient la forme ovoïde qui leur appartenoit.

On remarquoit au deſſus du gâteau ſupérieur des maſſifs de cire d'une forme arrondie et très irrégulière. Ces maſſes de cire différoient beaucoup par leurs dimenſions; les plus apparentes avoient un pouce et un quart de diamêtre, ſur cinq ou ſix lignes de hauteur; on

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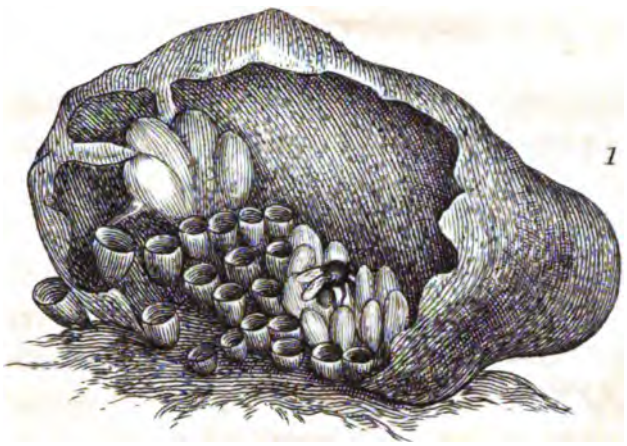
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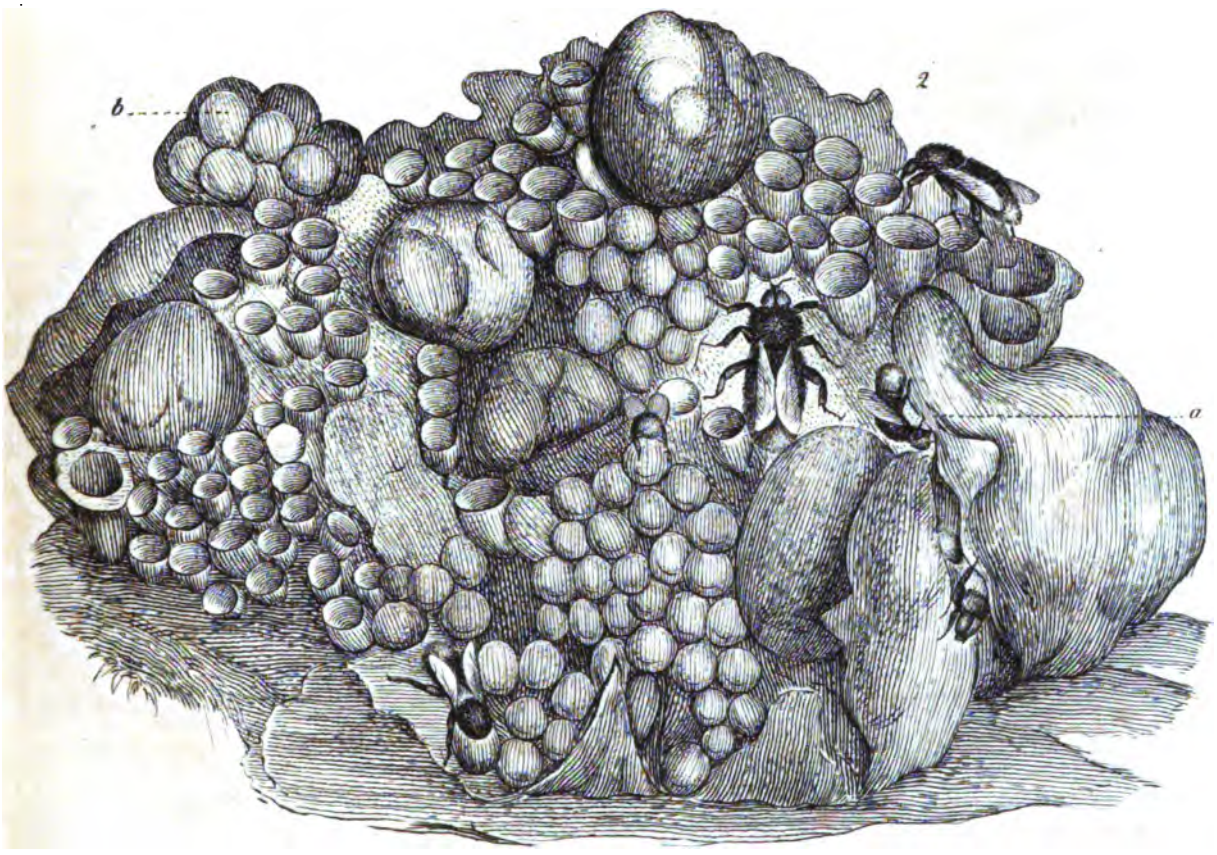
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en voyoit de moins groſſes, les plus petites n'avoient que 3 ou 4 lignes de largeur; leur forme étoit ordinairement celle d'un ſphéroïde applati; quelquefois on trouvoit dans ces maſſifs une grande quantité de pouſſière d'étamines humectée avec du miel. On découvroit au milieu de cette pâtée un grand nombre de petits vers qui paroiſſoient s'en nourrir; car la cire qui formoit ces maſſifs n'étoit point deſtinée à leur nourriture, comme le penſoient Swammerdam et Réaumur, mais à les préſerver du froid, de l'humidité, et des accidens.

Il ne faut pas confondre ces logemens habités par pluſieurs individus, avec d'autres logemens également couverts de cire à l'extérieur, et d'une forme à peu près ſemblable, mais dont l'intérieur étoit tapiſſé d'une ſoie très délicate. Ces coques ovoïdes dont nous avons déjà parlé ne ſont habitées que par le ver qui les a filés (TAB. XXVII. fig. 1. a.): on trouvoit après cela un aſſez grand nombre de petits vaſes remplis de miel dans tous les coins, et ſurtout au milieu du gâteau.

J'ai trouvé, comme Mr. de Réaumur, trois ſortes de mouches dans ces nids; des femelles, des mâles, et des ouvrières neutres.

Les jeunes femelles ne paroiſſoient qu'à la fin de Juillet et dans le courant des mois d'Août et de Septembre; elles étoient beaucoup plus grandes que les autres mouches; leur couleur étoit quelquefois la même que celle des ouvrières, d'autres fois elles en différoient beaucoup.

On ne trouvoit qu'une femelle au printems; c'étoit la mère, comme je m'en ſuis aſſuré en la voyant pondre plus d'une fois.

Toutes les ouvrières n'étoient pas auſſi neutres que Mr. de Réaumur le croyoit, et les mâles ne travailloient point, quoique cet obſervateur l'ait prétendu; je montrerai cependant qu'ils ont plus d'une utilité pour la choſe commune.

J'ai obſervé pluſieurs eſpèces de Bourdons; leurs mœurs ne différoient

féroient pas eſſentiellement ; j'ai même ſuivi ceux qui faiſoient des toits de mouſſe au-deſſus de leur nid ; ils ne ſe conduiſoient pas différemment dans l'intérieur de leur habitation que les Bourdons qui vivoient à une plus grande profondeur.

Après avoir donné une idée générale des nids de Bourdons, j'eſſayerai de décrire les particularités les plus importantes de leur hiſtoire ; et comme c'eſt dans des cellules d'une cire particulière que naiſſent les Bourdons, je parlerai dabord de la matière dont elles ſont compoſées.

CHAPITRE IV.

De la Cire des Bourdons.

MONSIEUR DE REAUMUR parle de la cire des Bourdons qui habitent à la ſurface de la terre, lors qu'il décrit les toits de mouſſe dont leurs nids ſont recouverts ; il dit que les Bourdons mettent un enduit de cette matière ſur toute la ſurface de l'intérieur de ces toits ; qu'ils y font dabord un eſpèce de plafond, de cire brute, et qu'ils en recouvrent enſuite toutes les parois ; il ajoute que la couche de cette matière n'a environ qu'une épaiſſeur double de celle d'une feuille de papier, qu'elle eſt impénétrable à l'eau, et qu'elle contribue à la ſolidité de l'édifice, en liant enſemble les brins de mouſſe dont le toit eſt compoſé.

Monſieur de Réaumur, occupé de l'hiſtoire générale des inſectes, n'a donné aux Bourdons qu'une attention partagée ; auſſi ce grand naturaliſte nous a-t-il laiſſé bien des queſtions à réſoudre, et des points à éclaircir ; je me trouverai heureux ſi l'on veut bien regarder mes obſervations comme un ſupplément à ſon travail.

La cire des Bourdons eſt la première pierre de l'édifice; elle eſt le berçeau de toute la peuplade, le ciment de tous les gâteaux, la ſeule matière que ces inſectes puiſſent pétrir, la ſeule enfin qu'ils ſachent manier.

Cette matière dont ils ſavent faire un toit pour garantir leur nid des eaux qui pourroient filtrer au travers de la terre, et dont ils font des vaſes propres à retenir leur miel, n'eſt cependant point ſi délicate, ſi blanche, ſi ferme et ſi fuſible, que celle des Abeilles; elle n'eſt point propre à des travaux auſſi délicats.

Il ne s'agit point de conſtruire un double rang de cellules héxagones, à fonds pyramidaux; il ne s'agit point de donner certaines méſures aux logemens des individus de ſexes différens, comme chez les Mouches à miel; tous les travaux devoient être plus ſimples chez les Bourdons.

Il falloit élever une famille plus ou moins nombreuſe d'inſectes, aſſez ſemblables aux Abeilles; leurs goûts, leurs beſoins, étoient les mêmes; la nature a cependant voulu qu'ils parvinſſent aux mêmes fins par des moyens différens.

Si chez les Bourdons le nombre des ouvrières eſt plus petit qu'il ne l'eſt chez les Abeilles communes, ſi les matériaux qu'ils employent ſont plus groſſiers, et leurs ouvrages moins délicats; l'on pourra cependant remarquer, que tout eſt en proportion chez les inſectes qui nous ſemblent moins parfaits, et que le bien être de la peuplade réſulte conſtamment de l'ordre et de l'accord de toutes les parties.

Monſieur de Réaumur ne nous donne aucune idée exacte ſur la nature et ſur l'origine de la cire; il paroit même, en pluſieurs endroits, la confondre avec la pouſſière des étamines; ſa couleur, ſa conſiſtance, ſes propriétés, en diffèrent cependant d'une manière ſenſible.

La cire des Bourdons que j'ai obſervé étoit brune, molle; et le pollen que ces inſectes conſervent dans leurs magazins eſt ordinairement jaune, friable, et ſe réduit en poudre ſous les doigts. On verra par l'analyſe que je joins ici, que ces matières diffèrent encore à bien d'autres égards. Mr. de Réaumur croyoit ſans fondement, que le pollen étoit une eſpèce de cire *brute*, que les Abeilles ſavoient convertir en véritable cire; il avoit donné à la matière molle dont les Bourdons ſe ſervent dans leurs nids, le nom de cire; et jugeant par analogie, il lui avoit attribué la même origine. Il me ſembla qu'on ne pouvoit adopter un tel ſentiment, ſans un examen plus approfondi; c'eſt ce qui m'engagea à faire quelques recherches ſur l'origine de la cire des Bourdons.

Le pollen ſe convertiſſoit-il en cire dans l'eſtomac des Bourdons? C'eſt une queſtion qui étoit facile à réſoudre. Je ſavois que les Bourdons pouvoient ſe nourrir pendant quelque tems avec le pollen qu'on trouve dans leurs magazins. J'imaginai de les ſevrer de miel; de leur donner autant de pollen que je pourrois m'en procurer; de les enfermer, et de leur donner un gâteau compoſé de quelques coques, qui ne continſſent pas de cire. Ce plan fut exécuté; les Bourdons n'en firent point de cire pendant tout le tems qu'ils ne furent nourris que de pollen. Je crus pouvoir conclure de là, que le pollen ne leur avoit ſervi que de nourriture dans cette circonſtance, et qu'il n'avoit pas été converti en cire dans leur eſtomac.

L'expérience ſuivante, l'inverſe de la première, me prouva bien plus clairement encore, que la cire n'étoit pas du pollen préparé; elle prouve même que le pollen n'entroit pour rien dans la compoſition de cette matière; et que, par conſéquent, Mr. de Réaumur avoit ſuppoſé à la cire des Bourdons une origine qui ne lui convenoit point.

J'enfermai d'autres Bourdons ſous une cloche de verre; je leur donnai

donnai auſſi un petit gâteau de coques dégarnies de cire; je les ſevrai de pollen, et je les nourris de miel.

J'obſervai dès le ſecond jour, que les coques avoient changé de couleur depuis la clôture des Bourdons.

Ces loges de ſoie, ordinairement d'un jaune clair, étoient devenues brunes au ſommet, luiſantes et gluantes; le lendemain je fus étonné de voir que la matière colorante avoit été enlevée de deſſus les coques de cire; et qu'elles étoient jaunes comme auparavant; mais le ſurlendemain je ſçus ce qu'elle étoit devenue,—je vis que les Bourdons en avoient fait un pot à miel ſur le bord du gâteau.

Je trouvai le jour ſuivant, que la femelle avoit conſtruit une cellule de cire neuve ſur l'une des coques, et qu'elle y avoit dépoſé des œufs.

La matière dont elle avoit été conſtruite étoit parfaitement ſemblable à la cire ordinaire des Bourdons, excepté qu'elle étoit plus luiſante, propriété qui tenoit peut-être à ce qu'elle avoit été produite depuis peu: cette expérience m'apprit non ſeulement que le pollen n'entroit pas dans la compoſition de la cire, mais elle me découvrit que le miel étoit la matière première de cette ſubſtance, et qu'il ſe convertiſſoit en cire par l'effet d'une élaboration particulière.

Mais étoit-ce la partie ſucrée du miel, ou quelqu'autre principe, qui avoit produit dans le corps des Bourdons cette cire que je trouvai ſur leurs gâteaux?

Il falloit une expérience directe pour le décider; je commençai par repéter la précédente, et j'obtins le même réſultat.

J'imaginai de nourrir ces mêmes Bourdons avec du ſucre humecté; je leur donnai un autre gâteau qui ne contenoit aucune parcelle de cire.

Je les tins enfermés ſous une cloche de verre. Au bout de vingt-quatre heures je vis diſtinctement le deſſus du gâteau teint en brun; je ramaſſai avec la lame d'un canif la matière colorante; j'y reconnus

bientôt la cire comme la première fois; cette ſubſtance expoſée au feu ſur une lame de verre ſe fondoit, et couloit un peu; elle bouillit bientôt après, et laiſſa échapper une odeur déſagréable.

Je conclus de cette dernière expérience, que la partie ſucrée du miel ſuffiſoit pour mettre les Bourdons en état de produire de la cire.

Je n'avois pas encore vu de quelle manière les Bourdons produiſoient cette cire; je penſai dabord qu'elle ſortoit par leur bouche, et que les Bourdons enduiſoient de cire, ou peignoient les gâteaux, en ſe ſervant de leur langue comme d'un pinceau; mais avant de me laiſſer perſuader par une ſimple conjecture, je cherchai à m'inſtruire de la vérité par de nouvelles obſervations.

Je penſai que ces Bourdons feroient vraiſemblablement de la cire, lors même que je ne leur donnerois point de gâteau.

Je plaçai une table devant ma fenêtre, à fin de voir au grand jour les moindres détails; je mis une feuille de papier parfaitement blanc ſur cette table; je la couvris avec un récipient de verre, et j'en fermai ſous la cloche un certain nombre de Bourdons d'une autre eſpèce; je les nourris avec du miel, que je leur donnai ſur une carte, et je les obſervai.

Les Bourdons ſe rangèrent en cercle autour de leur mangeoire; ils déployèrent leur trompe, et prirent avec cet inſtrument tout le miel que je leur avois donné.

Ils mangèrent pendant près de 10 ou 15 minutes; j'en vis alors quelques-uns ſe mettre un peu ſur le côté, broſſer leur ventre avec les pattes de la ſeconde paire, ſe frotter de même à l'endroit où les demi-anneaux ſe rencontrent ſur les côtés de leurs corps, et ſe redreſſer enſuite: ils faiſoient alors paſſer tour-à-tour les deux jambes qui venoient de broſſer leur ventre entre les deux jambes de derrière, qui ſe rapprochoient l'une de l'autre; et tandis que celles-ci ſerroient l'une de celles de la ſeconde paire, le Bourdon faiſoit effort

pour la retirer de l'eſpèce de pince dans laquelle il l'avoit engagée: par cette manœuvre bien ſimple les jambes de la troiſième paire enlevoient à celles de la ſeconde toute la matière qu'elles avoient priſe ſur les anneaux. TAB. XXVII. Fig. 2.

Mais quand les jambes de la troiſième paire étoient aſſez chargées de cette matière, il falloit auſſi qu'elles s'en dépouillaſſent, et c'étoit par un autre moyen.

Les Bourdons y parvenoient en les frottant du haut en bas aſſez rapidement: quand la matière étoit arrivée à leur extrêmité, ils la pouſſoient ſur le parquet. Ces Bourdons répétoient deux fois cette manœuvre pour chacune des jambes broſſantes.

Dans cette opération on a vû les Bourdons frotter leur ventre avec les jambes de la ſeconde paire, puis les faire paſſer ſucceſſivement deux fois entre celles de la troiſième, qui finiſſoient par dépoſer ſur le parquet la matière dont elles avoient été chargées.

D'autres fois ils frottoient leur ventre avec les jambes de la troiſième paire, et les faiſoient paſſer entre celles de la ſeconde; cette opération l'inverſe de la précédente avoit le même réſultat, et les jambes de la ſeconde paire ſe dépouilloient enſuite, de la même manière, de tout ce qu'elles avoient pris à celles de la troiſième. TAB. XXVII. Fig. 3.

Tous ces Bourdons firent pluſieurs fois la même manœuvre; et quand j'en eus découvert le but, j'examinai avec beaucoup d'attention la matière que leurs jambes laiſſoient après elles ſur le papier.

C'étoit ordinairement des points noirs ou bruns, preſque liquides, mais qu'on ne pouvoit examiner que lorſqu'il y en avoit un certain nombre; alors, en les réuniſſant ſur la lame d'un couteau, on y reconnoiſſoit la même matière que celle dont les Bourdons ſe ſervent pour faire des pots à miel; elle ſe fondoit ainſi que leur cire ordinaire, et répandoit la même odeur quand elle étoit expoſée au feu. Ils en faiſoient tous les jours une quantité aſſez conſidérable; mais

elle

elle étoit bien petite, ſi on la comparoit à la doſe de miel qu'ils conſommoient; ils pouvoient en couvrir la moitié d'une carte en un jour; la couche étoit dabord très mince, mais elle devenoit graduellement plus épaiſſe: ils me prouvèrent enfin, que c'étoit leur véritable cire eu en conſtruiſant des pots à miel ſous mes yeux.

L'apparition preſque inſtantanée de la cire ſur les anneaux des Bourdons qui venoient de manger du miel, étoit un fait très remarquable; il m'importoit de le conſtater; je crus dabord néceſſaire d'écarter une objection qui ſe préſenta à mon eſprit; on auroit pû croire que la matière cireuſe n'avoit pas été produite inſtantanément dans le corps des Bourdons que j'avois enfermés; et qu'elle avoit été élaborée par ces inſectes, avant l'inſtant de leur clôture, par l'effet de la nourriture qu'ils avoient pû choiſir. Il y avoit un moyen bien ſimple de vérifier ou de détruire cette conjecture; il ne s'agiſſoit que d'enfermer un grand nombre de Bourdons, et de leur donner du pollen, qui ne pouvoit que les nourrir ſans les mettre en état de produire de la cire.

S'ils avoient fait de la cire dans leur priſon, il auroit été prouvé que l'élaboration de cette matière avoit été faite avant la clôture; ſi, au contraire, ils n'avoient point fait de cire, la ſuppoſition d'une élaboration antérieure à la clôture auroit été détruite; j'aurois alors donné du miel à ces mêmes Bourdons toujours priſonniers, et j'aurois obſervé ce qui ſe ſeroit paſſé avec l'attention la plus ſcrupuleuſe.

Ce fut le 20 Juillet que je fis cette expérience; les Bourdons que j'avois ſequeſtrés et reduits au pollen pour toute nourriture, ne firent point de cire; un ſeul de ces inſectes broſſa une fois les côtés de ſon ventre, mais ſes jambes ne déposèrent rien ſur le parquet de ſa priſon. Quand je me fus bien aſſuré qu'ils ne pouvoient faire de la cire, je leur donnai une abondante ration de miel; je vis alors la mère et les ouvrières broſſer leur ventre, et dépoſer ſur le parquet la matière qui avoit ſuinté au travers de leurs anneaux; le réſultat

de

de cette expérience écartoit le doute que j'avois élevé, et il me parut démontré que la matière cireuſe n'étoit pas dans le corps des Bourdons avant qu'ils euſſent mangé du miel, et que ſa production inſtantanée étoit l'effet de cette nourriture.

Cette vérité fut pleinement confirmée dans la ſuite par pluſieurs obſervations.

L'une des plus remarquables fut, que des Bourdons, nourris quinze jours avec du miel ſeulement, firent aſſez de cire dans leur priſon pour pouvoir en conſtruire deux pots à miel, ſous mes yeux.

Une autre obſervation qui vient à l'appui de tout ce que j'ai avancé juſqu'à préſent ſur la cire, mérite auſſi quelque place dans ce chapitre.

J'avois enfermé une douzaine de Bourdons ſous une cloche de verre; je leur avois donné une portion de gâteau dépouillée de cire autant qu'il avoit été poſſible, et j'avois réſolu de les nourrir de miel pendant quelques jours, pour confirmer une des expériences précédentes.

Leur gâteau étoit compoſé d'une dixaine de coques de ſoie; ces loges qui contenoient des nymphes étoient tellement inégales, que le gâteau n'avoit aucune aſſiette; ſa mobilité inquiétoit extrêmement les Bourdons: s'ils avoient eu de la cire, ils n'auroient pas manqué de l'aſſujettir; ils ne pouvoient monter ſur le gâteau ſans le faire pencher, et ſans le mettre en mouvement: cependant leur habitude, ou plutôt leur affection pour les nymphes que contenoient ces coques, exigeoit qu'ils ſe tinſſent ſur le gâteau pour rechauffer les petits: ils inventèrent un expédient ſi ingénieux, pour ſolidifier ce gâteau, que je ne puis réſiſter à l'envie de le raconter.

Ils ſuppléèrent au défaut de la cire, en ſoutenant le gâteau *à force de bras*, comme on le voit dans la TAB. XXVII. Fig. 5.

Quand

Quand ils appercevoient par le balancement du gâteau qu'il alloit pencher de leur côté, ils deſcendoient un peu ſur ſes bords, et ſe tenoient ſuſpendus par les jambes de derrière au haut des coques, tandis qu'ils étendoient en embas les jambes de la ſeconde paire, qui ſont très longues, comme on le voit (Tab. XXVII. Fig. 4.). Ils attendoient dans cette attitude, que le mouvement du gâteau leur fit atteindre la table. Alors ils s'y cramponnoient avec les crochets de leurs pieds, comme dans la figure 5, et reſtoient dans cette poſture juſqu'à ce qu'ils fuſſent fatigués. D'autres Bourdons venoient alors les relever; pluſieurs à la fois retenoient ainſi le gâteau en ſituation; la mère elle-même les aidoit dans ce travail extraordinaire: ce manège dura deux ou trois jours; je le fis remarquer à pluſieurs perſonnes, qui le virent ainſi que moi, et qui n'en furent pas moins frappés.

Cependant le miel que je leur avois donné les avoit mis en état de produire de la cire; au bout de deux jours les coques étoient entièrement couvertes de matière brune et cireuſe. Le troiſième jour les Bourdons ne ſoutenoient preſque plus leur gâteau; ils avoient conſtruits des pilliers de cire, qui partoient de la table, pour aller ſoutenir celles des coques, dont la baſe étoit plus éloignée du plan; ce qui les diſpenſoit du travail extraordinaire que j'avois admiré les jours précédens.

Ces pilliers ne durèrent pas longtems; ils finirent par ſe rompre: leur cire s'étoit ſéchée, et n'adhéroit plus avec la même force au plan. Les Bourdons eurent recours au même expédient, pour arrêter le mouvement de leur gâteau; ils recommencèrent à le ſoutenir avec leurs jambes; j'eus alors pitié d'eux, et je colai leur gâteau ſur la table où il étoit poſé.

J'obſervai dans toutes ces expériences que la mère produiſoit beaucoup plus de cire que les ſimples ouvrières.

Je

Je vis dans d'autres occaſions des mâles que j'avois enfermé ſéparément, et nourris de miel, ſe broſſer les côtés comme les ouvrières; mais je ne pus examiner la matière qu'ils laiſſoient ſur le parquet; ce ſera le ſujet de nouvelles obſervations.

En réuniſſant mes obſervations ſur la cire je trouve,

1. Que la cire et le pollen ſont deux matières eſſentiellement différentes.

2. Que le pollen n'eſt point la matière première de la cire.

3. Que des Bourdons nourris de miel ſeulement font de la cire.

4. Que c'eſt la partie ſucrée du miel qui produit la cire dans le corps de ces inſectes.

5. Que cette cire ſort de leur corps en très petite quantité à la fois, et par les vides que laiſſent entr'eux les anneaux écailleux dont le corps de ces inſectes eſt garni deſſus et deſſous.

6. Que leur cire ſort de leur corps un inſtant après qu'ils ont mangé du miel.

7. Que les femelles font une plus grande quantité de cire que les autres individus.

8. Que les mâles paroiſſent en faire ainſi que les ouvrières, et que les femelles; mais on verra dans le chapitre ſuivant que les ouvrières et les femelles ſeulement ont été inſtruites à l'employer à différens uſages.

CHAPITRE V.

De la Manière dont les Bourdons employent la Cire dans leurs Conſtructions.

VENONS tout de ſuite au principal uſage de la cire; voyons comment on prépare au ver du Bourdon le logement et la nourri-

ture. Je ſuppoſerai dabord un nid ſemblable à celui que j'ai décrit dans le chapitre troiſième; tel qu'on le trouvera au mois de Juin, peuplé d'un nombre de mouches aſſez conſidérable, et pourvu d'une mère bien feconde; je ſortirai le nid de la terre; je le mettrai au grand jour ſur ma fenêtre; je le couvrirai d'un récipient, ou d'une cloche de verre; je laiſſerai aux Bourdons la liberté de ſortir, au moyen d'une porte pratiquée dans la planche ſur laquelle j'aurai poſé leur nid; à la faveur de tous ces préparatifs je pourrai obſerver et décrire ce que j'aurai vû.

Mais le nid proprement dit eſt encore caché à mes yeux par une calotte de cire, qui s'élève tout autour des gâteaux, et qui vient ſe former en voûte au deſſus d'eux.

Rien n'eſt plus facile que d'enlever cette calotte, mais les Bourdons la reconſtruiſent en peu de tems; ce n'eſt cependant point un inconvénient, parceque la douceur de ces inſectes permet toujours de la détruire.

Au deſſous de cette voûte on voit déjà deux rangs de gâteaux compoſés de coques oblongues, de maſſifs de cire de différentes formes, et de pluſieurs pots à miel.

Le nid ne contient point encore de mâles ni de jeunes femelles; on ne trouve ſur les gâteaux que des ouvrières, et la femelle qui leur a donné le jour. On voit ſouvent cette mère, fort agitée, courir çà et là ſur le nid, s'arrêter ſur un maſſif de cire, ou ſur un de ces pots à miel dont j'ai parlé, enlever avec ſes dents quelques parties de cire ſur ſon bord, puis ſe remettre à courir; s'arrêter au point de réunion de trois coques, y dépoſer le brin de cire qu'elle apportoit, et réitérer ce manège juſqu'à ce qu'elle ait élevé un petit tas, auquel elle puiſſe donner une certaine forme.

Elle ronge alors cette maſſe de cire dans le milieu; elle fait paſſer dans ſa machoire les parcelles de matière qu'elle en retire; et les poſant ſur le bord du creux, elle les pêtrit avec ſes dents, ainſi que celles

celles qu'elle y avoit laiſſées; elle amincit les bords de la petite cavité, et en l'approfondiſſant d'avantage elle donne plus de hauteur à ſes parois; elle recule un peu, et travaille la matière qu'elle trouve ſous ſa machoire; elle recule encore; mais en tournant autour de ſa cellule, car ſa tête n'en quitte preſque jamais le bord, elle tourne ainſi à reculon juſqu'à ce qu'elle ait fait le tour du petit creux, qui prend déjà la forme du calice d'un gland. Cela fait, elle retourne chercher de la cire, qu'elle vient poſer ſur le bord de la cellule; elle en apporte aſſez en deux ou trois fois pour élever ſes bords de trois ou quatre lignes.

On voit ſouvent les ouvrières l'aider dans ce travail, d'autres fois le faire en entier; tantôt elles font pluſieurs de ces cellules les unes à côté des autres; tantôt elles defont la parois qui les ſépare pour n'en faire qu'une ſeule, plus large que les autres.

Mais dès que la cellule eſt achevée la mère vient lui donner la dernière perfection; elle en polit l'intérieur, en arrondit les contours, en épaiſſit les parois et en relève les bords.

C'eſt là qu'elle doit dépoſer ſes œufs; c'eſt là que ſes petits paſſeront une partie de leur vie, qu'ils ſeront nourris juſqu'à ce qu'ils ſoient en état de voler. Mais après leur avoir conſtruit une demeure aſſez ſpacieuſe pour les premiers jours de leur vie, elle ſemble ſonger auſſi à leurs premiers beſoins; elle pourvoit d'avance à leur nourriture; elle va chercher du pollen dans ces pots où les Bourdons conſervent quelquefois des pouſſières d'étamines, et qui ſont ordinairement deſtinés à contenir leur miel. Elle revient et dépoſe dans le fond de la cellule une épaiſſe couche de pollen, mais elle l'étend de manière à laiſſer pour ſes œufs le plus grand eſpace poſſible.

Tandis que la femelle prépare un logement et des vivres pour ſes petits, les ouvrières ſont occupées à divers travaux qui méritent d'être connus. Un certain nombre d'entr'elles conſtruiſent la voûte de cire qui recouvre les gâteaux; c'eſt ordinairement à la baſe

des coques antérieures qu'elles fixent l'origine de cette enveloppe; elles la commencent d'abord d'un ſeul côté; elles attachent pour cela quelques parcelles de cire à pluſieurs coques contigues; elles en apportent d'autres qu'elles placent entre les premières, ce qui forme une ligne plus ou moins courbe; cette ligne, fort étroite, eſt la baſe de leur premier travail: elles vont enſuite chercher de la cire dans leur nid; et lorſqu'elles reviennent, on voit à leur bouche un petit morceau de cette matière, qu'elles poſent et qu'elles arrangent avec leurs dents ſur les premiers brins. Leur nombre augmente, et l'on voit bientôt s'élever un mur de cire plus haut dans ſon milieu qu'à ſes extrêmités, et dont l'épaiſſeur n'excède pas un huitième de ligne: cependant le nombre des travailleuſes eſt aſſez grand pour que l'ouvrage avance à vue d'œil, le mur s'élève déjà au deſſus des coques, d'autres ouvrières en conſtruiſent de ſemblables de tous les côtés à la fois. Ils ont leurs baſes fixées ſur le fond du nid ſur les feuilles, ou même ſur le terrain; ces murs ſont attachés aux coques des gâteaux, qui leur donnent toute la ſolidité dont cet ouvrage eſt ſuſceptible.

Tous ces murs ſont bientôt joints enſemble par d'autres murs ſemblables, et conſtruits de l'un à l'autre; on voit déjà un cintre irrégulier d'un pouce de hauteur ou d'un pouce et demi autour des gâteaux.

Juſqu'ici le travail des Bourdons avoit été vertical; leurs jambes antérieures et leur tête poſée ſur le bord de l'enveloppe étoient occupées à augmenter ſa hauteur, tandis que les pattes poſtérieures étoient fixées ſur les coques les plus voiſines; on voyoit leurs antennes placées aux deux côtés du bord de la petite muraille, comme pour diriger le travail des dents; celles-ci placées de la même manière en arrière des antennes paîtriſſoient la nouvelle cire qu'elles venoient d'apporter, et qu'elles mêloient avec la vieille: leur tête faiſoit un petit mouvement en avant; les dents dépoſoient alors une petite

petite bande de cire ſur le bord de cette enveloppe, et donnoit au tout une épaiſſeur parfaitement égale.

Les pattes antérieures ſervoient, pour ainſi dire, de bras à ces inſectes; c'eſt avec ces membres qu'ils tenoient en ſituation le bord de cire qu'ils travailloient; leurs jambes de la ſeconde paire ſervoient à les ſupporter; ils les cramponnoient dans la cire, et cette attitude ſembloit faciliter leurs diverſes manœuvres.

A cette époque le travail devient horizontal; les Bourdons, au lieu d'ajouter de nouvelles bandes au deſſus du bord de leur muraille, les entent un peu de côté, comme font les maſſons lorſqu'ils commencent à conſtruire le cintre d'une voûte; bientôt ils quittent entièrement le travail vertical, et font au deſſus du nid un toit plus ou moins horizontal; on les voit ſouvent alors à califourchon ſur le bord de la voûte à laquelle ils ſe cramponnent et ſe ſuſpendent au moyen des crochets dont leurs pieds ſont munis.

Ils ſont repréſentés dans cette attitude TAB. XXVI. Fig. 2.

Les Bourdons travaillent alors de côté, mais c'eſt avec la même dextérité que lorſqu'ils élèvent le mur qui eſt la baſe de leur vôute; elle s'étend en tout ſens avec une grande rapidité, et bientôt elle eſt entièrement formée, tous les bords ont été joints enſemble, et les Bourdons n'ont laiſſé que quelques ouvertures fort irrègulières, deſtinées à leur ſervir de paſſage. Ces inſectes ſont véritablement alors ſous une tente d'une toile de cire; elle eſt ſoutenue en pluſieurs endroits par de petits pilliers de forme irrégulière, qui partent de deſſus les coques, et qui arrivent à la ſurface inférieure de la voûte.

Un pouce quarré de cette toile de cire pêſe à peu près quatre grains; les plus grandes enveloppes que j'ai vû avoient ordinairement quatre pouces quarrés, et peſoient par conſéquent environ 64 grains.

J'enlevai un jour l'enveloppe d'un nid de Bourdons rouges et noirs, très peuplé, et au bout de deux jours ils en eurent conſtruit une nouvelle qui peſoit 55 grains, elle pouvoit avoir 3 pouces $\frac{7}{10}$ quarrés de

de ſurface: j'enlevai encore pluſieurs fois leur enveloppe ſans les décourager; ils en firent quatre en neuf jours; je les peſais, et leur poids réuni montoit à 272 grains, ce qui équivaut à celui d'une toile de cette matière qui auroit huit pouces quarrés de ſurface; ils en firent une nouvelle en 4 à 5 jours, qui peſa 93 grains.

Les Bourdons dans l'état de nature couvrent leurs nids de mouſſe, et, comme Mr. de Réaumur l'avoit obſervé, ils la ſolidifient au moyen d'une couche de cire fort mince qu'ils conſtruiſent au deſſous: mais lorſqu'on leur refuſe les matériaux néceſſaires, ou lorſque la nature les a placé trop loin de la mouſſe et des brins d'herbe, ils ſavent s'en paſſer, et conſtruiſent leur toit en cire ſeulement comme je viens de le raconter.

Le hazard m'a fait découvrir un trait de leur induſtrie que la nature ne m'eut certainement jamais offert. J'avois recouvert un nid de Bourdons avec une cloche de verre, comme je le fais ordinairement; les bords de la cloche ne poſoient pas exactement ſur la table où elle étoit placée; il y avoit même certains endroits où le plateau étoit ſi fort voilé, qu'un Bourdon auroit pû paſſer ſous les bords de la cloche avec la plus grande facilité. Je remplis les vuides avec de la toile groſſière; je la fis même entrer fort avant dans la cloche, afin de la fermer plus ſurement. La ruche étoit établie dans mon cabinet; un long canal vitré, adapté à la porte du nid, conduiſoit les Bourdons hors de la fenêtre par une ouverture que j'avois pratiquée dans le bois même de la croiſée, et au moyen de ces préparatifs je pouvois obſerver ſans riſquer d'être piqué. Je vis bientôt les Bourdons attaquer les morceaux de toile qui fermoient leur ruche; ils en arrachoient les fils les uns après les autres; ils les cardoient avec leurs dents, et les coupoient auſſi menus que des brins de coton; ils réuniſſoient enſuite ces brins avec leurs jambes; ils en formoient des floccons qu'ils pouſſoient derrière eux, à méſure qu'ils les avoient cardés. Pluſieurs Bourdons étoient continuellement occupés

occupés à ce travail, tandis que d'autres individus de la peuplade s'occupoient à pouſſer avec leurs jambes ces petits monceaux de coton contre le nid même; ils travaillèrent à éfiler cette toile pendant près d'un mois; ils en entourèrent leur nid d'un tas épais au moins d'un pouce et demi en certains endroits, et qui s'élevoit juſqu'à la moitié de la hauteur du nid. Quand ils eurent éfilé une plus grande quantité de toile, ils en couvrirent entièrement l'enveloppe, comme ils auroient fait avec de la mouſſe, et même ils en firent entrer ſous l'enveloppe une aſſez grande quantité pour fermer tous les vuides qu'elle pouvoit laiſſer entre ſon bord et celui du gâteau.

D'autres Bourdons déchirèrent la couverture d'un livre dont je m'étois ſervi pour recouvrir la boëte où je les avois logé; ils coupèrent ces lambeaux de papier en fort petits morceaux, qu'ils réunirent au deſſus de l'enveloppe de leur nid.

Il paroit donc que ces inſectes ſavent profiter en de certaines occaſions des matériaux que la nature ne pourroit leur préſenter: on verra dans le chapitre dixième ce qui peut avoir donné lieu aux Bourdons de déployer un talent et un inſtinct auſſi extraordinaire.

Si l'on met des morceaux de toile ou de papier dans une ruche d'Abeille, elles les déchirent avec leurs dents, et en emportent les débris hors de leur habitation. A quelle cauſe pourroit-on attribuer cette différence de mœurs, entres des inſectes dont l'inſtinct paroit ſi raproché? Ne ſeroit-ce point que les Abeilles inſtruites à déchirer, à enlever les tiſſus de ſoie filés par les teignes dans l'intérieur de leurs gâteaux, prennent la toile et le papier pour l'ouvrage de leurs ennemis? tandis que les Bourdons, ſujets aux mêmes fléaux, ne ſavent point s'en défendre, et qu'ils n'enlèvent jamais les galeries que les teignes ourdiſſent dans leurs gâteaux?

Les inſectes qui vivent en ſociété ont cela de commun avec les hommes, que leur induſtrie augmente en raiſon de leur nombre. Il ſemble qu'une grande population facilite les travaux de toute eſpèce;

eſpèce; et c'eſt dans les nids les plus peuplés qu'il faut obſerver les ouvrages des inſectes, pour connoître le plus haut point de leur induſtrie.

J'ai obſervé pluſieurs fois que les Bourdons de même eſpèce n'exécutoient pas auſſi bien les mêmes travaux lorſqu'ils étoient en petit nombre, que lorſque leurs nids avoient plus d'habitans. J'ai remarqué que ceux dont les familles étoient moins nombreuſes ne doubloient point de cire leur toit de mouſſe, comme le font ceux qui habitent des nids bien peuplés; les premiers n'allongeoient pas leurs pots à miel, tandis que le beſoin forçoit les autres à uſer de cet artifice.

Il eſt cependant vrai, que pour commencer des obſervations il vaut mieux ſe contenter des familles les moins conſidérables; elles ſont plus faciles à examiner, le tableau en eſt moins confus, et l'on y peut ſuivre plus exactement les principaux traits de leur hiſtoire; mais ſi l'on déſire de connoître un plus grand nombre de faits, il ne faut plus s'en tenir aux ébauches de la nature, il faut chercher des détails nouveaux dans des nids bien peuplés. C'eſt là qu'on pourra rectifier ſes erreurs, et qu'après avoir généraliſé ſes idées, il ſera aiſé de les reduire à de juſtes bornes.

CHAPITRE VI.

De la Ponte.

LORSQUE la femelle a achevé la cellule qui doit recevoir ſes œufs, elle ſe met à pondre; mais elle eſſaie auparavant ſi le bout de ſon corps peut y entrer: quand elle la trouve trop étroite, elle en ſort et revient l'aggrandir; elle eſſaie une ſeconde fois, et ſi les

les dimenſions de la capſule ne ſont pas exactement celles qui conviennent au bout de ſon ventre, elle évaſe plus ou moins les bords de l'alvéole; elle réuſſit enfin, à leur donner une meſure exacte, et on la voit alors s'établir ſur la cellule.

Cependant elle fait de vains efforts pour pondre, les lèvres de ſon anus ne s'ouvrent pas aſſez pour laiſſer ſortir ſes œufs; mais elle a été inſtruite à faire uſage d'un inſtrument qui favoriſe ſes efforts, et dont j'ai longtems ignoré l'utilité.

Cet inſtrument eſt l'aiguillon dont le bout de ſon corps eſt armé, et dont elle ne ſe ſert preſque jamais comme d'une arme offenſive.

L'aiguillon chez ces inſectes n'a d'autre iſſue que l'anus, et cet anus eſt compoſé de deux lèvres horizontales, qui s'ouvrent et ſe ferment l'une ſur l'autre.

Lorſque la femelle eſt établie ſur l'alvéole, et qu'elle eſt rête à pondre, elle entr'ouvre avec effort les lèvres de ſon anus, en fait ſortir ſon aiguillon, et le pouſſant fortement en arrière, elle l'enfonce dans le bord de la cellule, qu'elle perce de part en part; la lèvre ſupérieure de l'anus ſe trouve donc priſe entre l'aiguillon et le bord de l'alvéole; ſes pattes poſtérieures embraſſent en même tems la cellule, et preſſent contre l'aiguillon la cire molle dont elle eſt formée: au moyen de cette dernière opération elle y tient aſſez fortement. Voyez TAB. XXVII. Fig. 6.

Si j'oſois donner une explication de ce fait, voici ce que je dirois:

Les lèvres de l'anus ont une tendance naturelle à ſe rapprocher; il faut une force extraordinaire pour rompre cette force muſculaire; l'effort ſe fait du dedans au dehors; et ſi quelques muſcles agiſſent dans ce ſens en cette occaſion, il leur faut un point d'appui, pour que l'anus puiſſe s'ouvrir; il faut que ſes lèvres ne ſe ſuivent pas l'une l'autre; mais elles ſe ſuivront, tant que l'une des deux ne ſera pas retenue par quelques moyens extraordinaires; car rien n'eſt plus mobile que les derniers anneaux du ventre de la femelle. Mais où ſeroit

cette pince? où ſeroit ce point d'appui? La nature a inſtruite les femelles des Bourdons à le chercher ſur les bords de la cellule qui doit recevoir leurs œufs, à engager la lèvre ſupérieure de l'anus entre la cire de l'alvéole et leur propre aiguillon; et à former ainſi une eſpèce de pince, qui en leur donnant une aſſiette convenable force leur anus de reſter entr'ouvert, et facilite leur accouchement.

Lorſque les femelles ſe ſont fixées ſur leur cellule, comme je viens de le dire, elles pondent ſix ou ſept œufs de ſuite, ſans changer d'attitude.

Il n'y a point d'exemple d'une ponte de ce genre chez les Abeilles et chez les Guêpes.

Les inſectes qui diffèrent encore plus des Bourdons, leur reſſembleroient-ils à cet égard? Cela n'eſt pas vraiſemblable; il exiſte une variété infinie dans toutes les opérations de la Nature, et plus les claſſes ſont différentes, moins les détails ſe rapprochent.

Les œufs des Bourdons ſont d'une ligne de longueur, un peu recourbés, et plus gros à un bout qu'à l'autre.

Ils paroiſſent au microſcope en quelque ſorte ſemblables à du chagrin; ils ſont d'une couleur laiteuſe et remplis de liqueur.

Swammerdam dit que ces œufs ſont plantés dans la cire de leur cellule par leur bout le plus pointu; ce fait n'a pas été confirmé par mes obſervations; j'ai toujours trouvé les œufs de Bourdons couchés les uns à côté des autres; ou les uns ſur les autres, ſans aucun ordre; la déſcription qu'il en a donnée eſt d'ailleurs exactement conforme à ce que j'ai vû.

A peine la femelle a-t-elle achevé de pondre, qu'elle ſonge à renfermer ſes œufs; elle rabat ſur eux les bords de leur petite loge; elle va ramaſſer ſur les coques de ſoie et ſur les pots à miel une ſuffiſante quantité de cire, pour enfermer ſes petits; elle remplit avec le plus grand ſoin les moindres interſtices; elle achêve ainſi la cloiſon ſupérieure de leur logement, et ſe couche ſur la cellule, en remuant

très vivement le bout de ſon corps au deſſus de leur berceau, comme ſi elle vouloit les couver; elle reſte quelquefois vingt minutes ſur la cellule; elle la quitte pour quelques inſtans, et y revient bientôt après.

Faire une cellule, la garnir de pollen, pondre des œufs, les renfermer—voilà bien des opérations—elles ſont faites en une demi-heure: ſi l'on s'étonne de cette rapidité, l'on ne ſera pas moins ſurpris de la cauſe qui oblige cette mère à ſe hâter ſi fort.

Au moment où ſes œufs ſont pondus, et lorſqu'elle commence à les renfermer, on voit les ouvrières ſe précipiter ſur leur cellule, et eſſayer d'en dérober quelques-uns; elles attaquent même ces œufs, lorſque la mère eſt occupée à les pondre; mais celle-ci a donné de ſi exactes dimenſions aux bords de l'alvéole, que les ouvrières ne réuſſiſſent point à les enlever pendant qu'elle reſte ſur la cellule; ces ouvrières harcellent cependant de telle manière l'extrêmité de ſon ventre, qu'elle ſe retourne en fureur, et les pourſuit juſqu'au bas du nid, battant des ailes.

D'autres Bourdons profitent du moment où la mère s'eſt écartée; ils viennent ſur la cellule avec les mêmes ſignes d'avidité, et en tirent à la dérobée un œuf, dont ils boivent le ſuc laiteux, et dont ils rejettent la coquille, qui n'eſt qu'une membrane tranſparente.

Quand la femelle revient pondre de nouveaux œufs, et qu'elle voit les Bourdons dévorer ceux qu'elle a déjà pondu, elle leur tombe deſſus à coups de dents, les pourſuit au fond du nid, et chaſſe tous ceux qui veulent approcher de ſa cellule; jamais le voleur n'éprouve d'autres effets de ſa colère; elle ne ſe ſert point contre lui de ſon aiguillon; car, individus pour individus, ils ſont tous égaux pour la nature, et celui qui eſt déjà parvenu à l'état de perfection vaut à ſes yeux celui qui ne fait que de naître.

Lors même que ces œufs ſont fermés ils ne ſont point à l'abri de la gourmandiſe des ouvrières; elles ſavent entr'ouvrir la cellule, et

attaquer ſes habitans ; la ſurveillance de la mère peut ſeule les en garantir.

Celle-ci fait alors la garde autour de ſes petits, avec une vigilance étonnante, pendant ſix ou huit heures.

Il paroit que les vieux œufs ſont moins recherchés des ouvrières que ceux qui ſont nouvellement pondus ; en effet, j'ai rarement vû les ouvrières les attaquer le ſecond jour.

J'eſſayai une fois de leur offrir de vieux œufs, au moment où elles attaquoient les nouveaux; elles renfermèrent ſoigneuſement les premiers, ſans tenter de s'en nourrir.

Que penſer de la Nature, quand elle ſemble donner aux inſectes la faculté de détruire leur propre eſpèce, lorſqu'elle permet aux Abeilles de tuer leurs mâles, et qu'elle laiſſe aux Bourdons le droit et l'envie de dévorer les œufs nouvellement pondus ?

Ne ſembleroit-il pas naturel d'en conclure, qu'elle veut opérer une déſtruction totale ? Cependant les eſpèces ſe conſervent, les familles ſe multiplient, les loix ne ſont point changées ; et il paroit au contraire, que c'eſt par le ſacrifice de quelques individus que la conſervation de l'eſpèce eſt aſſurée. Des obſervations particulières nous apprennent, que les Abeilles ne tuent leurs mâles que lorſqu'ils ſont devenus inutiles à leur peuplade ; ils conſommeroient une grande partie des proviſions, dont les Abeilles ont beſoin pour ſe nourrir pendant l'hiver ; et la Nature a préféré la conſervation des individus induſtrieux, à celle des mâles qui ne ſont plus d'aucun ſervice après le tems de la fécondation.

Quand au pillage des œufs de Bourdons, il faut en chercher la cauſe plus loin.

Il ne paroit d'aucune utilité à la peuplade même ; car les œufs qui ſont expoſés à la gloutonnerie des ouvrières ſont auſſi bien des œufs d'ouvrières que des œufs de mâles et de femelles.

Mais

Mais peut-être l'Auteur de la nature a-t-il voulu diminuer par là le nombre des mellivores.

Les Bourdons ſont les plus grands des inſectes qui ſe nourriſſent de miel; et ſi leur nombre étoit triple et quadruple, d'autres inſectes ne trouveroient plus de nourriture, et peut-être leur eſpèce ſeroit-elle détruite.

Cet argument prendra plus de force ſi l'on remarque avec quel ſoin la Nature a mis des entraves à la trop grande population des Bourdons. Ces inſectes ont pluſieurs ſortes d'ennemis; entr'autres une eſpèce de fauſſe teigne, et un gros ver blanc, qui ſe nourriſſent de leur cire, de leurs nymphes, et d'eux-mêmes quelquefois; ils ſont même chargés d'une nombreuſe famille de poux, qui s'attachent à leur corſelet, et qu'ils emportent avec eux dans les airs.

CHAPITRE VII.

Des Vers de Bourdons, et de la Manière dont ils ſe nourriſſent.

SWAMMERDAM n'ignoroit pas que les Guêpes donnent la béquée à leurs petits; que ceux de l'Abeille maçonne ſe trouvnt entourés, au ſortir de l'œuf, des alimens que leur mère a préparé; il ſavoit enfin, que les Mouches à miel préparent une bouillie particulière; qu'elles la mettent dans les cellules qui ſervent de berceau à leurs petits; qu'elles les nourriſſent jour à jour; et, ce qui eſt plus remarquable, qu'elles proportionnent la quantité et la qualité de cet aliment à l'âge et au ſexe de chaque individu.

Il paroit qu'il n'avoit pas obſervé les mœurs et l'induſtrie des Bourdons; rejettant les lumières que l'analogie pouvoit lui offrir, il veut que les petits de ces inſectes ſe nourriſſent de la matière même dont leurs berceaux ſont compoſés.

Je

Je ſais tout ce qu'on doit de confiance aux lumières de ce grand anatomiſte; mais il ne parle point ici d'après ſes propres obſervations, et je me trouve heureux de n'avoir à combattre qu'une conjecture, à laquelle il n'attachoit pas un grand prix.

Le ſimple récit des faits prouvera, je l'eſpère, que les vers de Bourdons ne ſe nourriſſent point comme ceux qui habitent nos fruits; qu'ils ne mangent pas la cellule qui leur ſert de berceau; que leurs nourrices connoiſſent l'inſtant où leurs petits ſont éclos, et où ils ont beſoin de leurs ſecours; qu'elles ouvrent alors leurs cellules pour leur donner à manger; qu'elles le font avec trop de délicateſſe pour pouvoir leur nuire; et qu'elles ferment après cela l'ouverture de l'alvéole; on verra enfin que les Bourdons nourriſſent en certain tems leur petits comme les Abeilles maçonnes, et en d'autres comme les Guêpes et les Mouches à miel.

Les vers de Bourdons ſont apodes et de couleur blanche; Mr. de Réaumur dit qu'ils ont ſur les côtés des taches noires de figure irregulière, plus longues que larges, et diſpoſées tranſverſalement: je n'en ai vû aucunes ſur le corps des vers que j'ai obſervé.

On diſtingue aiſément la tête de ces vers, dont la lèvre inférieure eſt fort avancée.

Leur corps eſt compoſé de treize ou quatorze anneaux.

Le cœur de ces inſectes paroit au travers de la peau: quand on les regarde du côté du dos il eſt rempli d'une liqueur tranſparente, et s'étend en ligne droite de la tête juſqu'à l'anus; j'ai toujours vû ces vers courbés ou en cercle; leur grandeur varie ſuivant l'âge, le ſexe, et l'eſpèce; ceux des femelles ſont toujours les plus grands.

Les vers de Bourdons ſortent de leurs œufs au bout de 4 à 5 jours; ils ſe nourriſſent d'abord du pollen préparé dans leur cellule; mais la proviſion qu'on leur en a fait n'étant pas conſidérable, ils n'ont pas des vivres pour fort longtems, ils dépendent alors des ſoins des ouvrières.

Celles-ci

Celles-ci viennent ſur la cellule ; elles font avec leurs dents un petit trou dans la cire du couvercle ; elles parcourent après cela les gâteaux, pour chercher du miel ou du pollen ; on les voit enſuite revenir ſur le berceau de leur petits, mettre leur tête dans l'ouverture qu'elles ont pratiquées, pénétrer juſques aux vers, reſter quelques inſtans dans cette attitude, retirer enſuite leur tête, et fermer la cellule.

Pendant que les Bourdons font les fonctions de nourrice, il eſt impoſſible de voir quelle matière ſort de leur bouche ; mais j'ai obſervé qu'ils font alors avec les anneaux de l'abdomen les mêmes mouvemens que pour dégorger le miel dans les réſervoirs qui lui ſont deſtinés ; les anneaux de leur abdomen rentrent les uns dans les autres, et le ventre ſe raccourcit conſidérablement ; leur bouche s'ouvre au même inſtant, et on voit découler dans les réſervoirs une partie du miel qui étoit dans leur eſtomac ; hors puiſqu'ils font le même mouvement lorſqu'ils mettent leur tête dans la cellule, ce n'eſt point apparemment par une ſimple curioſité qu'ils l'avoient ouverte, il eſt bien plus probable que c'étoit pour nourrir les jeunes vers ; et les obſervations ſuivantes confirment cette conjecture.

Quand ils nourriſſent leurs vers on ne peut appercevoir ſi c'eſt avec du miel ou avec du pollen ; il eſt à croire que c'eſt avec du pollen, puiſque c'eſt une nourriture qui leur convient dès l'enfance, et que les Bourdons eux-mêmes en mangent avec paſſion ; j'ai chaſſé de deſſus une cellule une ouvrière qui venoit de nourrir un ver, avant qu'elle eut eu le tems de boucher l'ouverture qu'elle y avoit faite ; j'ai écarté les parois de la cellule ; le ver y étoit couché en cercle à peu près horizontalement ; le centre du ver etoit rempli d'une liqueur jaune retenue par les peaux de ſon ventre ; je goutai cette liqueur, et j'y reconnus le goût du pollen mêlé avec le miel des Bourdons.

J'ai réuſſi à nourrir pendant pluſieurs jours un ver de femelle avec du pollen et du miel de ces inſectes ; ce qui me confirme encore dans mon opinion c'eſt que j'ai toujours trouvé l'eſtomac de ces vers rempli

rempli d'une matière jaune friable, très compacte, et ſemblable au pollen.

Les Bourdons ne préparent jamais de pollen dans les cellules qui doivent ſervir de berceau aux mâles et aux femelles; les uns et les autres ne naiſſent ordinairement qu'au mois d'Août et de Septembre; les ouvrières paroiſſent dès les mois de Mai et de Juin.

Quelle peut être la raiſon de la différence des ſoins que les ouvrières donnent aux mouches des trois ſortes?

Ce n'eſt pas qu'il y ait moins de pollen ſur les fleurs au mois d'Août qu'il n'y en a au mois de Juin; car les ouvrières en apportent tous les jours, dans les mois d'Août et de Septembre, et d'ailleurs elles en ont fait proviſions conſidérables à cette époque: mais voici l'explication que je pourrois donner de cette négligence apparente.

Le nombre des ouvrières eſt beaucoup plus grand au mois d'Août qu'il ne l'eſt au mois de Mai; à peine trouve-t-on au printems quelques ouvrières dans les nids de Bourdons; la mère commence ſeulement alors à n'être plus ſolitaire; dans les mois d'Août et de Septembre, au contraire, leur nombre eſt très conſidérable.

Les vers qui ſont nés dans les mois de Mai et de Juin courroient le riſque de manquer de nourriture s'ils n'avoient pas des proviſions dans leurs cellules; car le petit nombre des ouvrières ne permettroit peut-être pas qu'elles apperçuſſent le moment où ils écloſent, et celui où ils ont beſoin d'alimens, tandis qu'à la fin de l'été leur nombre peut ſuffire à ſurveiller et à nourrir tous les vers. La nature devoit donc pourvoir au défaut du ſoin des ouvrières dans les tems où elles ſont en plus petit nombre; mais cela étoit moins néceſſaire à la fin de la ſaiſon, quand les ſoins et les ſecours étoient plus faciles à obtenir.

Lorſqu'en automne les teignes et les autres ennemis des Bourdons viennent attaquer leur nid, et qu'ils mangent les proviſions journalières de la peuplade, un grand nombre d'ouvrières périt, et

les

les vers ne ſont que très mal ſoignés ; ils n'ont pas de vivres dans leurs cellules, et ne reçoivent aucun ſecours du déhors, ils meurent de faim dans leurs loges de cire, qui ne peuvent donc point leur ſervir de nourriture comme le croyoit Swammerdam.

Je ne puis terminer ce qui regarde la nourriture des vers, ſans m'arrêter ſur une obſervation qui ſembleroit contredire en partie ce que j'ai écrit ſur cette matière.

J'ai trouvé au printems, dans tous les nids de Bourdons, des boules de cire plus groſſes qu'aucunes de celles dont j'ai parlé ; lorſque j'enlevai la ſuperficie de ces boules, je reconnus qu'elle étoit, en effet, une pellicule de cette matière à laquelle j'ai conſervé le nom de cire ; je croyois devoir trouver au deſſous de cette pellicule un aſſez grand nombre de gros vers, mais je n'y vis qu'une couche épaiſſe, ou plutôt une maſſe d'une matière jaune et compacte, que je reconnus pour du pollen empilé et ſerré ; j'ouvris ce maſſif de pollen, et je trouvai dans ſon intérieur quantité de petits vers de Bourdons raſſemblés ; les vers s'y nourriſſoient du pollen qui les entouroit, ainſi que les vers du fruit, et du fromage, ſe nourriſſent des parois de leur habitation ; bientôt toute leur proviſion étoit conſommée, et ils ſe trouvoient ſous la cire expoſés à mourir de faim ; mais les ouvrières appercevoient en paſſant ſur leur logement, peut-être, qu'ils n'étoient plus environnés de pollen, et qu'ils étoient à nud ſous la cire ; elles les nourriſſoient donc à leur manière ordinaire, et dès lors le ſort de ces inſectes ne différoit plus de celui des vers dont j'ai parlé.

Ces détails ſuffiſent pour donner une idée aſſez exacte de la manière dont les Bourdons nourriſſent leurs petits ; je vais paſſer à ce qui regarde leur accroiſſement.

CHAPITRE VIII.

De l'Accroiſſement des Vers du Bourdon.

LES vers de Bourdons enfermés enſemble dans de petites loges de cire, avoient à prendre plus d'accroiſſement en tout ſens avant de ſe transformer en nymphes; ces loges étoient bien proportionnées à leur petiteſſe actuelle, mais je ne concevois pas comment ces vers, preſſés les uns contre les autres, pourroient ſe mouvoir, ou ſe développer dans un eſpace auſſi étroit: l'obſervation m'apprit ce que je n'avois pu diviner; je vis, en ſuivant ces loges avec beaucoup d'attention, et en les meſurant de jour en jour, que leurs dimenſions n'étoient plus ce qu'elles avoient été dans l'origine. Ces loges, que j'avois vu groſſes au plus comme un pois lorſque la mère leur avoit confié ſes œufs, étoient devenues par dégrés auſſi groſſes que des petites noix.

Mais comment ces loges s'agrandiſſoient-elles? c'étoit un nouveau problème; il n'auroit pas été difficile à réſoudre, ſi l'opinion de Swammerdam ſur la nourriture des vers avoit été plus fondée qu'elle ne l'étoit réellement; car s'il eut été vrai que les vers de Bourdons ſe nourriſſent en mangeant la cire de leur alvéole, il auroit été permis de ſuppoſer que leurs nourrices ſe ſeroient apperçues de leur nudité comme de leurs beſoins, qu'elles ſe ſeroient hâtées de les entourer d'une nouvelle couche de cire, et qu'en reconſtruiſant leur berceau, elles l'auroient proportionnée à leur âge et à leur groſſeur.

Mais on a vu dans le chapitre précédent, que les vers de Bourdons ne mangent point leur propre cellule; je fus donc obligé de chercher une explication plus ſatisfaiſante, et qui s'accordât mieux avec les faits que j'avois obſervé.

L'agran-

L'agrandiſſement des loges de cire n'avoit été remarqué par aucun naturaliſte. Un trait auſſi neuf, et auſſi intéreſſant, piqua ma curioſité, et je réſolus de ne rien negliger pour la ſatisfaire.

Cette recherche fut longtems infructueuſe; malgré tous mes efforts, je ne parvenois point à ſaiſir le moment où les loges s'agrandiſſoient; celles que j'avois meſurées l'inſtant d'auparavant n'avoient plus les mêmes dimenſions quand je revenois les obſerver.

Les traits les plus intéreſſans de l'hiſtoire naturelle ne font pas d'abord ſur nous tout l'effet qu'ils devroient produire, et ce n'eſt qu'après bien des obſervations qu'on peut eſpérer de voir ce qu'ils ont de plus ſaillant: on regarde ſouvent le premier apperçu comme un fait douteux; s'il ſe préſente encore il devient plus digne d'attention; mais il n'a tout ſon interêt, et il n'excite vraiment notre curioſité, que lorſqu'on en ſoupçonne le principe et le but.

Ce n'eſt que d'après un apperçu auquel je ne m'étois pas arrêté que je ſuis parvenu à découvrir la manière dont s'agrandiſſent les loges des vers.

J'avois vu dès le mois de Juin de grandes cellules de cire ouvertes par deſſus, et qui laiſſoient appercevoir dans leur intérieur pluſieurs vers de Bourdons reſtés à découverts; j'avois remarqué que les ouvrières en enlevoient quelques-uns et les emportoient hors de leur ruche; je m'intéreſſois à ces inſectes, et je les ſuivis pour connoître leur ſort; je negligeois de regarder ce qui ſe paſſoit ſur le nid; et lorſque je revenois à l'obſerver, je remarquois ſeulement que ces loges étoient refermées.

Ce ne fut que lorſque je m'occupai particulièrement de rechercher la manière dont ces loges s'étoient agrandies, que je me rappellai ces obſervations, et que je ſoupçonnai leur importance; je me condamnai donc à viſiter ces cellules de quart d'heure en quart d'heure, et à ne les quitter que lorſque j'aurois pris la nature ſur le fait.

Le 13 Août j'obſervai pluſieurs loges de cire de différente grandeur; une de ces caſes ſe fendit ſous mes yeux; la fente étoit longue de pluſieurs lignes, parceque la loge entr'ouverte étoit déjà d'une groſſeur conſidérable.

Comme il n'y avoit point de Bourdon ſur cette loge, je ne pûs douter que l'ouverture obſervée à ſa ſurface ne fut la ſuite naturelle d'un mouvement, ou d'un effort, qu'avoient fait les vers dont elle étoit remplie; la preſſion latérale de des vers, dont la taille croiſſoit chaque jour, devoit enfin obliger la légère cloiſon de cire qui les gênoit, à ſe fendre et à s'entr'ouvrir; et ce qui me prouva que c'étoit leur ſeule preſſion qui avoit occaſionné la déchirure dont je viens de parler, c'eſt que le ver qu'elle laiſſoit appercevoir dans toute ſa longueur ne montroit que ſon dos à l'obſervateur; s'il eut rongé la cellule pour l'entr'ouvrir, ç'auroit été ſon ventre et ſes dents que l'on auroit apperçu.

Il reſtoit à voir de quelle manière cette loge ſeroit renfermée. Je n'attendis pas longtems: une ouvrière s'approcha de la loge entr'ouverte, et dès qu'elle eut apperçu la fente, ou le ver qu'elle laiſſoit à nud, je la vis chercher de la cire ſur différentes parties du gâteau, la prendre avec ſes dents, la porter ſur la loge, et la placer entre les bords de ſon ouverture: quand elle eut employé toute la cire qu'elle avoit apporté, elle alla en prendre de la nouvelle ſur les cellules voiſines; elle revint bientôt avec ſa charge, de nouveaux brins de cire furent ajoutés à ceux qu'elle avoit placé précédemment; et quand elle eut répété trois ou quatre fois cette manœuvre la fente ſe trouva fermée, et la cellule agrandie de toute la largeur de la pèice qu'elle avoit fabriquée; elle fit à peu près comme cette teigne, qui, après avoir coupé longitudinalement ſon fourreau, l'élargit en y mettant une pièce, ou comme la couturière qui élargit la manche d'une robe.

Chez les Bourdons, les ouvrières ne coupent point une pièce de cire

cire pour l'ajuſter ſur l'ouverture de la cellule; elles conſtruiſent entre les deux bords de la fente une plaque qui ne ſe forme qu'à meſure qu'elles apportent de nouveaux brins, et qu'elles les maçonnent avec les autres; mais quoiqu'elles ayent à faire bien plus d'ouvrage que les teignes, la clôture et l'élargiſſement d'une cellule ne leur prend pas beaucoup de tems; celle que je ſuivis dans cette obſervation n'employa qu'une minute à ce travail.

Voilà comment ces alvéoles, qui ne contiennent ordinairement que ſix ou ſept vers, peuvent devenir de la groſſeur d'une noix.

La forme de ces grandes loges eſt quelquefois irrégulière; leur augmentation graduelle ne l'eſt pa moins.

Le 21 de Juin je vis une femelle pondre des œufs dans une cellule; le 24 ou le 25 je trouvai des vers de Bourdons à la place des œufs; le 27 ils avoient 3 ou 4 lignes de longueur, et leur cellule s'étoit agrandie de ſix à ſept lignes; le 1 Juillet les Bourdons la réunirent à deux petites cellules voiſines occupées par des œufs, ou par des vers qui venoient d'éclore; ce logement étoit d'une forme extraordinaire. Sa longueur étoit à peu près de dix-ſept lignes; ſa largeur varioit ſuivant la partie où on la meſuroit; elle avoit en quelques endroits cinq lignes, en d'autres deux ou trois ſeulement; ſa hauteur dépendoit auſſi du nombre et de la groſſeur des vers qui habitoient les différentes parties de la loge, car ils étoient ſouvent placés les uns au deſſus des autres ſans ſe déranger mutuellement.

Le 2 Juillet la loge avoit reçu quelque accroiſſement à l'une de ſes extrêmités, elle avoit ſept lignes en cet endroit.

Le 3 la même extrêmité eut onze lignes de largeur, ce fut le terme de l'accroiſſement de cette partie; la cellule ne groſſiſſoit pas par tout également, ni même en proportion, parceque les vers étant plus ou moins nombreux, ou plus ou moins agés, dans les divers points de ſa longueur, la faiſoient élargir de manière différente dans une progreſſion plus ou moins rapide.

Sa plus grande longueur fut de deux pouces; et tandis que les vers d'une extrêmité filoient leur coque, ceux de l'autre commençoient à peine à prendre quelque accroiſſement; la cellule prit enfin la forme d'une poire, bien différente des autres, qui étoient ordinairement circulaires, et un peu bombées.

Je remarquai à peu près dans le même tems une autre ſingularité rélative à un cellule de ce genre.

Les Bourdons d'une de mes cloches avoient conſtruit horizontalement un pillier de cire, qui partoit du bord du gâteau, et qui alloit ſoutenir l'enveloppe du nid; ils formèrent une petite cellule ſur le pillier même; elle fut bientôt peuplée de petits vers, qui groſſirent, et qui firent augmenter les dimenſions de leur habitation; comme elle s'accrût à la manière ordinaire, elle pouſſa l'enveloppe à une plus grande diſtance des gâteaux, et devint ſi maſſive, que les Bourdons furent obligés de la ſolidifier, au moyen de pluſieurs pilliers fort larges et fixés d'une part au gâteau, et de l'autre à ſon enveloppe cireuſe. Voyez TAB. XXVI. Fig. 1.

Lorſque les vers ont pris tout leur accroiſſement, ils ont un demi-pouce de longueur; c'eſt à cette époque qu'ils ont un véritable rapport avec les chenilles; ils ſavent, comme elles, ſe filer une coque de ſoie; on en verra les détails dans le chapitre ſuivant.

CHAPITRE IX.

Des Coques de Soie que filent les Vers de Bourdons avant leur Métamorphoſe.

LES vers qui avoient juſqu'alors habité la même cellule vont paſſer une partie de leur vie dans la ſolitude; chaqu'un d'eux ſe conſtruit un logement à part ſous le toit de cire où ils vivoient en commun.

La

La nourriture ne leur eſt plus néceſſaire; leur logement ſera impénétrable pour les ouvrières; la ſoie dont ils le conſtruiſent eſt ſi ſolidement tiſſée, que les dents de ces inſectes n'ont aucune priſe ſur elle; cette ſoie eſt blanche, et d'une fineſſe ſingulière.

La forme des coques n'eſt pas la même en tout tems; elle eſt d'abord celle d'une boule applatie. TAB. XXVI. Fig. 2. a. Le ver y eſt couché en cercle, elle deviendra oblongue. TAB. XXVII. Fig. 1. a. et le ver s'y tiendra de bout.

Le ver n'a plus beſoin d'aliment lorſqu'il a filé ſa coque; et quand les ouvrières ou la mère viennent lui donner la nourriture, elles trouvent ſous la cire un tiſſu difficile à rompre, et renoncent à le ſoigner.

Les vers enfermés d'abord dans la même cellule filent à peu près dans le même tems; les ouvrières dégarniſſent peu à peu leurs coques de ſoie de la cire qui les recouvre, et l'employent à différens uſages. Ce n'eſt qu'alors qu'on peut appercevoir la forme de ces nouveaux logemens; les Bourdons en enlèvent la cire, l'étendent ſur toute leur ſurface; la voûte qui cachoit la forme des loges conſtruites dans l'intérieur cède ſous leurs pas; elle fait voir en boſſes et en creux ces coques, et leurs intervales.

Au bout de deux ou trois jours ces coques ont entièrement changé de couleur, preſque toute la cire a diſparu, et ce qui en reſte n'a qu'une légère teinte de jaune.

Les vers n'ont plus qu'une opération à faire avant de paſſer à l'état de nymphe; la poſition circulaire qu'ils ont gardée n'eſt point celle qui leur convient pour ſe transformer. Avant de perdre leur peau, chaqu'un d'eux ſe redreſſe dans ſa cellule, qui n'étant plus garnie de cire ſe prête à tous ſes mouvemens; il lui fait prendre alors la forme d'un ovoïde alongé, dont le grand axe eſt vertical; et ſi l'on fend la loge de ſoie de haut en bas, on trouve le ver dans la ſituation où il eſt repréſenté dans la TAB. XXVII. Fig. 1.

Monſieur

Monſieur de Réaumur n'a point vû ce changement de forme des coques; il dit même que les vers ont la tête tournée en embas dans leurs loges de ſoie, et qu'ils ſortent enſuite par deſſous.

Ces deux aſſertions ne ſont pas confirmées par l'obſervation; mais avant de la prouver, je vais raconter les expériences qui établiſſent la réalité de ce changement de forme.

J'ai longtems cherché à voir cette transformation; elle ſe paſſe dans un moment ſi court, que je n'ai jamais pu en être le témoin; je me contentai donc de m'aſſurer du fait par deux expériences.

Première Expérience.

Je mis un nid de Bourdons dans une boëte vitrée; au haut du nid étoit une coque de femelle nouvellement filée; elle étoit encore applatie, et cylindrique; ſon diamètre étoit de ſix lignes, et ſa hauteur de quatre; la forme et les dimenſions de cette coque indiquoient le ſexe de l'individu qui l'habitoit; je meſurai la diſtance qui étoit entre la coque et le cryſtal; il étoit bien aiſé de ſavoir ſi elle s'alongeroit en meſurant enſuite cette diſtance.

Au bout de deux jours cette coque fut entièrement dégarnie de cire; le troiſième, j'apperçus un changement conſidérable dans ſes dimenſions; ſa forme étoit à peu près celle d'un œuf; elle avoit cinq lignes de diamètre dans ſa partie inférieure, et trois ſeulement à ſon autre extrêmité; ſa longueur me parut d'environ huit lignes; elle touchoit alors à la glace dont la boëte étoit recouverte, et les Bourdons eſſayèrent de l'attacher au verre avec de la cire: mais ce fut inutilement; leurs dents ne pouvant paſſer entre la coque et la glace, ils y renoncèrent.

Seconde Expérience.

Je voulois m'aſſurer que les vers ne ſe fileroient pas deux coques, l'une platte et l'autre alongée; je marquai donc avec de l'encre le milieu d'une coque applatie; au bout d'un jour elle avoit changé de forme, et la marque que j'y avois fait pouvoit encore ſe diſtinguer.

Ces

Ces deux expériences ne me laiſsèrent aucun doute ſur ce changement de forme.

C'eſt de la réunion d'un nombre, plus ou moins grand, de coques ſemblables que ſe forment les gâteaux des Bourdons; chaque cellule de cire donne lieu à la formation de ſept à huit coques de ſoie, qui adhérent enſemble, parceque les vers, en les filant, les ont attachées les unes aux autres: lorſque tous ces petits gâteaux ſont réunis, ils n'en forment plus qu'un ſeul, qui paroit à cauſe de cela très irrégulier, quoiqu'il ſoit compoſé de parties aſſez régulières.

On voit quelquefois deux ou trois grands gâteaux de coques rangés les uns au deſſus des autres, et qui ne ſont liés enſemble que par un peu de cire.

C'eſt dans ces coques oblongues que les vers paſſent à l'état de nymphes (TAB. XXVII. Fig. 1. *b.*); qu'ils perdent la peau, ou la robe, dont la nymphe étoit recouverte, et qu'ils ſe montrent ſous la forme de Bourdon; il ne leur manque que la couleur, la force, et le mouvement: au bout de quinze jours ils ont acquis tous ces avantages, ils ſont des inſectes parfaits.

Leurs membres ſe ſont durcis, et ſont devenus écailleux: ces inſectes ſont armés de dents également écailleuſes; leur corps eſt couvert d'un duvet gris, qui ſe colorera lorſqu'il aura été expoſé à la lumière.

Ces Bourdons commencent alors à ſe ſervir de leurs dents; chacun d'eux ronge ſa priſon aux deux tiers de ſa hauteur; dès qu'il a commencé, d'autres Bourdons viennent l'aider; ils la déchirent horizontalement un peu au deſſus du renflement; au bout d'un quart d'heure le nouveau Bourdon commence à ſortir de ſa coque, et le premier uſage qu'il fait de ſa liberté eſt d'aller aux proviſions.

CHAPITRE X.

Sur l'Uſage des Coques de Soie lorſque les Bourdons en ſont ſortis.

PLUS je compare les Bourdons avec les Abeilles, plus je trouve les loix par leſquelles ils ſe gouvernent adaptées à la ſituation, à l'état de ces peuplades.

Là, c'eſt un peuple ſi nombreux, que la peine et les travaux n'y ſont point épargnés; la matière ſeule y eſt précieuſe, parcequ'elle doit ſervir de berceau à un infinité d'individus; cette matière doit être d'uſage pendant pluſieurs années; auſſi, avec quelle adreſſe les Abeilles ne la travaillent-elles pas! et quels ſoins n'apportent-elles pas pour donner à leur ouvrâge toute la ſolidité dont il eſt ſuſceptible!

Chez les Bourdons, la cire groſſière dont ils ſe ſervent eſt ſouvent plus abondante qu'il ne faut, mais le nombre des individus eſt fort petit, par conſéquent la main d'œuvre très précieuſe: on reconnoitra par tout, combien la nature a eu ſoin de ne leur donner que des ouvrages faciles à exécuter.

Toutes les coques de ſoie que les jeunes Bourdons ont habité ont été coupées dans un plan horizontal, un peu au deſſus de leur renflement; le ver ne ſongeoit pas vraiſemblablement, en filant ſa coque, à l'utilité dont elle pouvoit être à la peuplade, quand elle ne ſeroit plus néceſſaire à ſon propre perfectionnement; mais celui qui dirige tout dans la nature dirigeoit auſſi ſes opérations.

La ſoie dont ces coques ſont faites, le tiſſu ſerré que les vers leur ont donné, la couche de cire dont elles ſont enduites, et dont tous les fils ſont imprégnés; la forme d'œufs tronqués qu'elles ont priſe quand les

les Bourdons en ſont ſortis, tout ſemble annoncer que ces coques doivent être d'un autre uſage pour la communauté.

C'eſt à contenir leur miel, et leur pollen, que les Bourdons ſavent les employer; toutes les circonſtances dont je viens de parler les rendent propres à cet uſage; mais avant de leur confier leurs proviſions, les ouvrières viennent enlever de deſſus leurs bords les lambeaux de ſoie que les jeunes Bourdons y ont laiſſé; elles égaliſent de leur mieux les contours de ces coques, et les enduiſent d'une épaiſſe couche de cire.

Chaque eſpèce de Bourdon perfectionne ſes pots d'une manière différente.

Les uns élèvent au deſſus du bord des coques de longs tubes évaſés, et compoſés de cire. (TAB. XXVII. Fig. 8.) D'autres y conſtruiſent des eſpèces de tubes, renflés au milieu, et retreins à l'ouverture, comme dans la figure 9.

Quelquefois ils ſe contentent d'ajouter à leurs bords intérieurs un anneau de cire, comme dans la figure 10.

D'autres fois ils rendent à la coque ſa forme originale, et ils ne laiſſent qu'une petite ouverture à ſa partie ſupérieure. Voyez fig. 11.

Enfin ils montrent qu'ils ne ſont pas inférieurs aux Abeilles dans l'art de l'économie; entre quatre pots alongés au moyen de ces tubes il ſe fait néceſſairement un vide; les Bourdons ſavent en profiter; ils en forment un cinquième pot, lui donnent un bord, l'arrondiſſent comme celui des autres, et s'en ſervent comme d'un reſervoir. Il n'eſt pas de la même forme que ceux qui l'entourent, il eſt quelquefois un peu quarré; s'il étoit régulier, il ne rempliroit pas tout le vide qu'on a laiſſé entre les autres pots; d'ailleurs, la groſſièreté et l'irrégularité de l'ouvrage laiſſent peu de champ à la géométrie. Fig. 12.

Les Bourdons regardent alors toutes les coques comme de ſolides

réſervoirs, auxquels ils peuvent confier leurs proviſions; quand ils reviennent de la campagne, ils cherchent à l'inſtant à décharger leur eſtomac du miel qu'ils ont recueilli ſur les fleurs; ils viſitent les pots comme pour s'aſſurer qu'ils ſont biens conſtruits; puis ils y font entrer leur tête, et une partie de leur corſelet, (fig. 73.) ils ouvrent leur bouche, et raccourciſſent leur corps, comme je l'ai dit ailleurs, le miel tombe dans le réſervoir, et les Bourdons retournent à la campagne.

On voit ſouvent près de ſoixante de ces pots dans un ſeul nid; j'en ai compté, au moment de la floraiſon des tilleuls, plus de quarante, qui furent remplis de miel dans un ſeul jour; quand ils ſont pleins, les Bourdons en rétréciſſent l'ouverture, mais ils ne la ferment preſque jamais.

Ces inſectes ne ſavent pas ſe nourrir les uns les autres, comme le font les Guêpes et les Abeilles; c'eſt dans ces pots toujours ouverts que chacun d'eux puiſe à ſon tour le miel dont il a beſoin.

Les Bourdons ſavent auſſi conſtruire des pots de cire, ſans le ſecours des coques; ils leur donnent ordinairement un fond de cire, d'autres fois ils ne font qu'élever des tubes de cette matière ſur le parquet ou ſur les bords de leurs gâteaux.

Le miel dont ils rempliſſent leurs magazins eſt auſſi doux que celui des Abeilles; il eſt plus coulant et plus clair, il a auſſi un goût particulier, mais il ne laiſſe pas de ſaveur âpre à la gorge.

Ces proviſions ne ſervent guère que pour la nourriture journalière; d'ailleurs il eſt rare que tous les pots ſoient pleins, et les vivres ſont bientôt conſommés.

Aux mois de Mai et de Juin on ne trouve des pots qu'au milieu du gâteau; parceque c'eſt là que ſont nés les premiers Bourdons.

Quand la mère pond enſuite les œufs de mâles et de femelles, c'eſt ſur

ſur les premières coques qu'elle établit les petites cellules où elles les enferme; ils y croiſſent et font agrandir chaque jour leur logement; ils y filent des coques, dont la réunion compoſe un ſecond gâteau. Ces coques ſervent enfin de magazin aux Bourdons, comme celles des ſimples ouvrières.

Je dois faire obſerver ici, que les mâles et les femelles ſont élevés dans les mêmes cellules de cire, et qu'ils y ſont nourris de la même manière. Les coques ſoieuſes des femelles ſe montrent au milieu des coques de mâles, et elles ſervent enſuite de reſervoir comme les autres; ils ont l'avantage d'être plus grands.

Ces coques ſervent auſſi de magazin pour les pouſſières d'étamines que les Bourdons apportent dans leur nid; je n'ai point vû de quelle manière ces inſectes recueillent cette matière ſur les fleurs, mais Mr. de Réaumur a vû les Abeilles ſe charger de leur pouſſière, et en former des pelottes, qu'elles appliquoient à leurs jambes poſtérieures.

Les jambes des Abeilles, ainſi que celles des Bourdons, ſont compoſées de pluſieurs parties, dont l'une, que Mr. de Réaumur appelle pallette, eſt platte, et parfaitement liſſe, mais entourée de poils; ces poils, courts et forts chez les Bourdons, et longs chez les Abeilles, ont fait donner à cette partie de la jambe le nom de corbeille. Dès que les Mouches-à-miel ſont arrivées ſur les fleurs où elles veulent faire des proviſions de cette eſpèce, elles ouvrent avec leurs dents les anthères des étamines, ces petites bourſes qui contiennent les pouſſières fécondantes; elles frottent leur ventre ſur la fleur, ramaſſent avec leurs jambes les pouſſières qui ſe ſont attachées aux poils de leur corps, les portent à leur bouche, forment de petites maſſes de cette matière, et les font paſſer de jambe en jambe, juſqu'à celle qui doit s'en charger; elles les preſſent alors dans leur corbeille à l'aide de leurs pattes, et un grand nombre de ces petites maſſes forment enfin une pelotte de pollen, de la groſſeur et de la forme d'un grain de poivre applati.

Les

Les Bourdons viennent de la campagne chargés de pelottes ſemblables, tantôt vertes tantôt jaunes, quelquefois noires d'autres fois blanches, et ſouvent de la groſſeur d'un pois ordinaire.

On voit ſouvent des Bourdons chargés de leurs pelottes. TAB. XXVII. Fig. 13. repréſente le Bourdon qui s'en décharge dans un des petits reſervoirs dont j'ai parlé ; il monte ſur ce pot, il cramponne ſes jambes de la première paire ſur le bord convexe de la coque ; il y fait entrer celles qui ſont chargées de pouſſière, ainſi que celles de la ſeconde paire; il ſerre et preſſe les jambes chargées entre les deux autres ; celles-ci pouſſent en même tems les deux pelottes en avant ; ces pelottes gliſſent le long des jambes, et tombent dans le réſervoir.

Le Bourdon retire alors ſes pattes hors du pot ; il ſe retourne, et deſcend la tête la première dans le réſervoir, il étend avec ſes dents le pollen ſur le fond du vaiſſeau, et y mêle quelquefois un peu de miel, qu'il a rapporté dans ſon eſtomac.

Les Bourdons deſtinent les nouvelles coques à leur ſervir de magazins : dès qu'elles ſont vides ils abandonnent les anciennes, qui ſe trouvent au fond des gâteaux, parcequ'elles ſont trop éloignées du lieu où ils ſe tiennent, c'eſt-à-dire, des gâteaux nouvellement conſtruits, où ils ſoignent et rechauffent leurs petits ; peut-être auſſi les negligent-ils, parcequ'elles ſont plus expoſées à la voracité de leurs ennemis: ils ſavent, cependant, encore en tirer parti; ils les effilent avec leurs dents, et en font un boure, ou une eſpèce de vouatte, dont ils recouvrent leur nid en guiſe de mouſſe. C'eſt peut-être par une ſuite du même inſtinct que ces inſectes charpiſſent et cardent la toile que l'on met à leur portée, et qu'ils la font ſervir aux mêmes uſages.

On voit donc, en général, que les Bourdons ſavent profiter de tous les avantages que la nature leur préſente, et qu'ils ſavent faire ſervir les mêmes choſes à des uſages différens.

Monſieur

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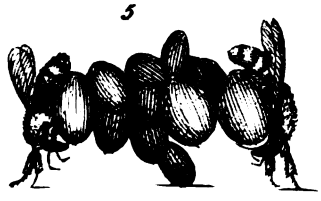
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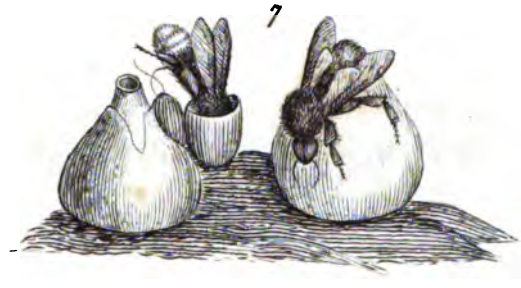
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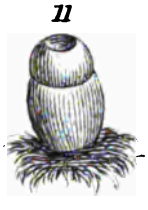
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Monſieur de Réaumur croyoit que les jeunes Bourdons ſortoïent de leurs coques de ſoie par en bas, ou par deſſous. Je ne comprends pas comment ils l'auroient fait, puiſqu'ils auroient toujours rencontré la terre, ou les gâteaux inférieurs; d'ailleurs, lorſqu'on retourne un gâteau ſens deſſus deſſous, les nymphes qui s'y trouvent enfermées deviennent noirâtres, et périſſent en peu de tems; mais de quel uſage auroient été toutes ces coques, lorſque les Bourdons en ſeroient ſortis par le bas? Ils n'auroient pas pû s'en ſervir pour y tenir leurs proviſions, ils auroient été obligés de conſtruire en cire un grand nombre de petits vaſes, ce qu'ils ne font que très rarement. Je ne ſais où cet obſervateur a pû fonder cette conjecture; toutes les coques que j'ai vû dans mes nids de Bourdons étoient ouvertes par le haut, et elles ne l'étoient en deſſous que lorſque les teignes, ou d'autres ennemis de ces inſectes, venoient dévorer les nymphes dans leur aſyle. Cependant, Monſieur de Réaumur a vû, ſans doute, les ouvertures de ces coques tournées en bas, car il l'a dit, et l'on ne peut douter de ſon exactitude. Il faut donc que ceux qui lui ont apporté des nids de Bourdons ayent renverſé leurs gâteaux; les ouvertures des coques auront été ainſi tournées en bas, et cet obſervateur aura pû prendre pour une diſpoſition néceſſaire, ce qui n'étoit qu'un effet du hazard.

CHAPITRE XI.

Des Mâles et des Femelles, et de leur Sort après la Fécondation.

LA Providence, qui laiſſe à certains animaux la liberté de ſe reproduire en toutes ſaiſons, ne détermine point celle de la génération de quelques eſpèces, mais fixe le laps de tems qui doit s'écouler entre

entre une portée et celle qui lui ſuccède, tandis qu'il en eſt pour qui les époques ſont déterminées, et que parmi quelques inſectes elle dirige encore l'ordre de la ponte. C'eſt ainſi que l'Abeille ne peut donner le jour aux mâles que dans une ſeule ſaiſon, quoiqu'elle ponde conſtamment des œufs d'ouvrières; qu'on ne voit point la Guêpe élever les males et les femelles avant l'automne; et que le Bourdon ne produit pas ſes femelles avant le tems où elles peuvent recevoir les ſoins multipliés qu'elles attendent des neutres.

Les femelles de Bourdons ne naiſſent pas dans toutes les eſpèces au même moment; les unes paroiſſent au mois de Juin, d'autres au mois de Juillet, et celles des Bourdons rouges et noirs ne ſe montrent ordinairement qu'au mois d'Août.

Les mâles naiſſent auſſi à différentes époques; on verra dans la ſuite la cauſe, ou du moins l'utilité, de cette diſpoſition.

Les femelles portent leurs œufs juſques au printems, et ne les pondent point dans le nid qu'elles habitent pendant le premier été. Il reſte à décider, dans quel lieu elles paſſent l'hiver, comment elles ſe préſervent des grands froids, omment elles ſe nourriſſent alors. Si elles ne prennent pas de nourriture, ſeroit-ce l'engourdiſſement qui les rendroit capables de s'en paſſer?

Ce ſont là autant de problêmes que Mr. de Réaumur avoit laiſſé à réſoudre; il imaginoit "que les femelles de Bourdons ſe retiroient " dans des trous de muraille, ou dans quelques cavités ſouterraines, " et qu'elles s'y engourdiſſoient pendant l'hiver, juſques à ce que le " ſoleil du mois de Mai eût rechauffé le terrein, et les eût rappellé " à la vie et à leurs occupations."

Une obſervation faite par un homme dont l'exactitude ne peut être miſe en doute, ſembloit confirmer cette conjecture. Le ſecrétaire de mon père avoit découvert un nid de Bourdons dans une prairie; il le viſita en automne, et il ne trouva plus d'ouvrières ni de mâles ſur les gâteaux; mais, en examinant la cavité, il apperçut une cellule creuſée

creuſée en terre, et habitée par une ſeule femelle de Bourdon. Cette mouche n'étoit point encore engourdie ; elle prit le vol dès qu'elle apperçut le jour, et s'éloigna à perte de vue.

J'ai fait à ce ſujet une obſervation, qui appuye encore l'opinion de Mr. de Réaumur, et qui nous apprend que les grandes femelles de Bourdons ſurvivent ſeules à tous les individus dont leur famille eſt compoſée ; qu'elles ſe font un logement particulier auprès de leur nid, et qu'elles s'y enferment aux approches de l'arrière ſaiſon.

Le 21 Août je pris un nid de Bourdons de la ſixième eſpèce ; quand j'eus ôté la mouſſe dont ils étoient entourés, j'enlevai les gâteaux ; ils paroiſſoient abandonnés les ouvrières et les mâles avoient diſparu ; il y reſtoit ſeulement quelques femelles que j'enfermai avec leur nid dans une boëte faite exprès : en examinant plus attentivement la cavité ſouterraine, je découvris une autre loge, qui communiquoit avec la première par une gorge aſſez étroite ; j'enlevai délicatement le gazon qui la recouvroit ; je vis alors une grotte, ou plutôt une galerie, longue d'un pied au moins, et large de deux pouces et demi.

Je remarquai encore, que cette grotte étoit jonchée de mouſſe et de brins d'herbe, mais je n'y vis rien qui put ſervir d'aliment aux individus qui l'habitoient. Au moment où je ſoulevai le gazon qui lui ſervoit de toit, j'apperçus trente ou quarante femelles : je ne ſais ſi elles furent alarmées du dégat que je fis dans leur retraite, ou de la lumière qui y pénétra, mais dès qu'elle fut découverte, toutes ces femelles prirent l'eſſort, quelques-unes s'éloignèrent beaucoup trop pour que je puſſe les ſuivre : néanmoins, le plus grand nombre ſe précipita dans la cavité d'où les gâteaux avoient été tirés ; il me fut aiſé de les ſaiſir, et de m'aſſurer que c'étoient de jeunes femelles : ſi je ne les avois pas dérangées, elles ſe ſeroient engourdies dans la loge où elles étoient enfermées, elles y auroient paſſé l'hiver, et n'en ſeroient

ſorties que lorſque le ſoleil du printems leur auroit rendu la chaleur et le mouvement.

Les mâles et les mulets de Bourdons vivent moins de tems que les femelles, car ceux qui naiſſent au printems ou dans le courant de l'été périſſent tous dans l'automne de la même année ; mais les femelles qui naiſſent au mois d'Août, pour le plus tard, paſſent l'hiver à l'abri des injures de l'air, mênent une vie laborieuſe dès les premiers jours du printems, et meurent ordinairement à l'âge d'un an.

Les mâles et les ouvrières des Guêpes et des Frelons ne vivent qu'un été, comme ceux des Bourdons ; ils périſſent comme eux avant l'hiver ; les femelles ſeules ſurvivent : elles ſe tapiſſent à la fin de l'automne dans quelques trous, ou bien elles ſe mettent à l'abri ſous des tas de feuilles ſéches, et dans les paillaſſons de jardins ; les premiers froids les font tomber dans un engourdiſſement, qui dure tout l'hiver, et qui ne ceſſe qu'au retour du printems.

Dès le mois de Mars on voit les femelles de Bourdons reparoître, et voltiger ſur les fleurs ; c'eſt alors qu'elles commencent leur nid dans la ſolitude, mais on ne connoit leur hiſtoire qu'au mois de Juin : elles viſitent ſeulement au printems un grand nombre de trous, comme je l'ai dit ailleurs ; on peut croire qu'elles y cherchent un logement tel qu'il le faut pour établir leur famille.

CHAPITRE XI.

Sur les petites Femelles des Bourdons.

LA fécondité n'a point été accordée à tous les individus d'une ruche d'Abeille ; cette apparente caſtration, dont la nature ſemble être coupable, eſt peut-être un des chefs-d'œuvre du Créateur ; l'habilité

bilité des individus ſtériles ſemble ſi bien compenſer le défaut des organes de la génération, qu'on ne ſauroit dire leſquels ſont les plus utiles ; de ceux qui donnent le jour à toute la peuplade, ou de ceux qui logent, nourriſſent, ſoignent, et élèvent les petits.

Qu'arriveroit-il ſi toutes les Abeilles étoient reines, ſi toutes les Abeilles pouvoient pondre quinze à vingt mille œufs ? Telle eſt cependant la fécondité de cette mouche, qui entretient ſeule la population d'une ruche d'Abeille ; et la nature lui a refuſé non ſeulement l'art de conſtruire une cellule, mais celui d'élever et de nourrir un ſeul des petits qu'elle pond chaque jour.

Ces inſectes ſont cependant du même ſexe ; le même œuf contient le germe d'une ouvrière et celui d'une reine ; et l'éducation du ver, c'eſt-à-dire, le genre de ſa nourriture, et la forme de ſon logement peuvent en faire un individu ſtérile, ou un inſecte dont les organes de la génération ſoient parfaits à tous égards ; elle peut même en faire un individu totalement dépourvu d'induſtrie, ou une mouche douée de l'art le plus étonnant que la nature ait confié aux inſectes.

Il eut été bien ſingulier, qu'entre les deux extrêmités de cette chaine, dont l'un des bouts eſt occupé par la fécondité, et l'autre par l'induſtrie, la nature n'eut mis aucun intermédiaire ; auſſi connoiſſons-nous chez les Abeilles deux ſortes de mouches, qui ſemblent tenir le milieu entre les reines et les ouvrières ; ce ſont les petites reines, et les ouvrières fécondes ; les premières avoient été apperçues par Needham ; leur exiſtence a été prouvée par pluſieurs obſervations de mon père. Ces inſectes, que l'on trouve rarement en vie dans les ruches, naiſſent dans des cellules royales auſſi grandes que celles des autres reines ; cependant, ils leur ſont beaucoup inférieurs par leur taille ; leur couleur, la forme de leurs machoires, et des articulations de leurs jambes, ſont autant des rapports qu'elles ont avec les Reines Abeilles ; autant de caractères qui les diſtinguent des ſimples ouvrières : on ne

les a jamais vû pondre, elles ont cependant des ovaires; voilà où ſe bornent nos connoiſſances rélativement aux mouches de cette ſorte.

Mais les individus qui ont plus de rapport avec les ouvrières qu'avec les reines, et qui cependant ſemblent tenir le milieu entr'elles, ces mouches qu'on appelle fécondes, ſont ſemblables aux ouvrières par leurs caractères extérieurs; même couleur, même taille, mêmes dents propres à ciſeler la cire, mêmes jambes capables de porter des pouſſières d'étamines; mais ſi elles ne ſont pas ſtériles, elles ne ſont que demi-fécondes; elles ne pondent jamais que des œufs de mâles.

On ne trouve de ces individus que dans les ruches qui ont perdu leur reine; la ponte de ces ouvrières entretient pour quelque tems l'intérêt et l'occupation dans la peuplade, qui ne tarderoit pas à périr ſans cela: tandis que les Abeilles ſont occupées à ſoigner et à nourrir les vers de mâles, elles ne ſongent point à déſerter leur ruche; mon père penſe auſſi que les mâles provenus de la ponte de ces ouvriéres ſont peut-être deſtinés à féconder les reines, qui ne ſe ſont transformées qu'après le maſſacre des faux Bourdons, parceque les mâles iſſus des ouvrières naiſſent ordinairement après cette époque. Chez les Bourdons, l'induſtrie n'a pas été accordée excluſivement aux mouches infécondes; au contraire, la femelle qui naît au mois d'Août, qui paſſe l'hiver en terre, et qui reparoit au printems, eſt la plus habile ouvrière dont ſa famille ſera compoſée; elle creuſe une cavité dans la terre, y conſtruit des cellules, nourrit et élève ſes petits dans la ſolitude; une ouvrière ſeule ne feroit point ſes travaux, ſa taille ſembleroit déjà s'y oppoſer; et d'ailleurs, on voit rarement une ouvrière iſolée s'occuper d'aucune eſpèce de travail.

La conformation des machoires de la femelle eſt entièrement ſemblable à celle des ouvrières; ſes jambes ſont également capables de ſe charger des pouſſières d'étamines, les couleurs des unes et des autres ſont pour l'ordinaire diſtribuées de la même manière ſur toutes les parties de leurs corps: il ſemble qu'à tant de rapports ſi l'on ajoute celui

celui de la fécondité, on fera des ouvrières autant de petites femelles; car la différence de la taille eſt le ſeul caractère extérieur qui puiſſe les faire diſtinguer.

Or c'eſt ce que la nature a fait, mais les petites femelles chez les Bourdons diffèrent encore à d'autres égards des femelles en titre.

C'eſt au commencement du printems que les grandes femelles pondent les œufs qui doivent donner des ouvrières et des mâles, mais elles pondent plus tard ceux qui doivent donner des mères aux peuplades futures. Toutes les ouvrières qui naiſſent au printems ne ſont pas neutres, comme on l'a cru juſqu'à préſent; il en eſt de fécondes; on en voit pluſieurs dans chaque nid. Ces mouches font toutes les fonctions des mères; elles ſont quelquefois très petites, et à cauſe de cela le nom de petites femelles peut ſervir à les diſtinguer; elles ſont entourées dès leur naiſſance d'un petit nombre de mâles provenus des œufs de la mère commune; ces mâles les fécondent dès le mois de Juin; elles pondent bientôt après; et ce qui eſt bien remarquable, c'eſt qu'elles n'engendrent que des mâles, comme ces ouvrières que l'on obſerve quelquefois dans les ruches d'Abeilles, et qui ne pondent que des œufs de faux Bourdons. Mais ſi l'utilité de ces dernières eſt problématique, il ne paroit évident que les petites femelles des Bourdons ſont deſtinées à fournir un plus grand nombre de mâles aux jeunes et grandes femelles, puiſqu'après les avoir pondu et ſoigné, elles périſſent comme les ouvrières au commencement de l'automne.

Les mâles, auxquels elles donnent naiſſance, ſervent, comme je m'en ſuis aſſuré, à féconder les grandes femelles qui paroiſſent à la même époque, et qui ſans ce ſupplément auroient courru le riſque de ne plus trouver de mâles dans leur habitation, et de reſter infécondes.

Si l'on juge par analogie, l'on pourra conjecturer que c'eſt à l'eſpèce d'aliment qu'on prépare aux vers de Bourdons que ſont dues ces différences qu'on peut remarquer dans leur inſtinct.

Chez les Abeilles il a été prouvé par des expériences bien faites que

des

des vers d'Abeilles communes étoient, à l'âge de trois jours, ſuſceptibles de devenir reines, s'ils étoient dès lors nourris avec de la bouillie royale, et s'ils étoient logés dans des cellules ſemblables à celles des reines.

L'on aura donc peu de peine à comprendre comment le même moyen peut être employé avec ſuccès chez les Bourdons, car les mœurs de leurs ouvrières ont bien du rapport avec celles de leurs femelles. De même l'on comprendra que ce moyen, employé avec quelques nuances, pourra faire de ces vers des vers de petites femelles.

C'eſt ici un des plus beaux traits de la puiſſance de la Nature, le fait eſt frappant chez les Abeilles; elle convertit à ſon gré des mouches ſtériles en des mouches fécondes, des inſectes inhabiles et mal-adroits en d'autres inſectes pleins d'adreſſe et d'induſtrie; mais quelle peine n'auroit-on pas attribuer à des cauſes en apparence éloignées, et ſi peu dignes d'attention, des effets auſſi ſinguliers, des effets auſſi frappans!

Cependant, il n'eſt pas impoſſible qu'un certain genre de nourriture puiſſe être plus favorable qu'un autre à l'accroiſſement et au perfectionnement des organes ſéxuels, et des membres d'un individu; mais comment concevoir qu'il puiſſe changer les paſſions, l'inſtinct et les mœurs d'inſectes originairement ſemblables? concevoir qu'une femelle deſtinée à jouïr de l'amour, à ſentir la jalouſie, à exercer ſa vengeance, à vivre dans l'oiſiveté,—que le germe de cette femelle, ou plutôt le fêtus d'un tel inſecte, puiſſe devenir celui d'une ouvrière zélée pour la défence commune, privée d'un plaiſir que la Nature n'a refuſé à aucun de ſes enfans, mais délivrée des peines de l'accouchement, laborieuſe, pleine d'adreſſe, habile à ſoigner les petits, à chercher du miel ſur les fleurs, capable de faire de la cire, de conſtruire des rayons dont les cellules hexagones ayent des fonds pyramidaux, de ſoigner les reines, dont elles auroient été les rivales ſi les organes de la génération euſſent été développés chez elles, et chargée de tuer dans un certain tems les mâles, qui n'auroient point alors excité ſa jalouſie?

Voilà une véritable métamorphoſe. La chimie l'expliquera-t-elle? Nous apprendra-t-elle jamais, par quel ſecret la différence des nourritures peut produire un changement ſi complet dans l'inſtinct, les goûts, et les habitudes de ces inſectes? Il eſt permis d'en douter; qu'ici donc la raiſon et la philoſophie nous ſervent de flambeau.

Où ſeroient ces chefs-d'œuvres de l'architecture, ces colonnes, dont le fuſt eſt élevé ſur les proportions de l'homme; ces ſtatues qui repréſentent à l'eſprit les actions des héros; ces monumens de la gloire, ces tableaux, dont les couleurs font illuſion, et qui nous repréſentent les plus belles formes de la nature? Que deviendroit cette préférence de l'homme pour tout ce qui eſt parfait dans ſes proportions, dans ſes contours, dans ſes couleurs, ſi cet être intelligent eût été privé de l'organe de la vue? ſi dès ſon origine l'homme n'eût connu que par ſon toucher, par ſon ouie, par l'effet des odeurs, et par la différence des ſaveurs? L'eût on vû découvrir de nouveaux mondes, meſurer les cieux, calculer la diſtance, le poids reſpectif et l'étendue des planettes, et découvrir enfin la loi du mouvement, celle de la gravitation, le ſecret de l'univers? Voilà quels peuvent être les effets d'un ſens, d'un organe, ſur l'induſtrie, et ſur les habitudes de l'homme; ils n'ont pas moins d'influence en proportion ſur l'inſtinct des inſectes; et quoique nous ne puiſſions pas prouver que la Reine Abeille poſſède plus ou moins de ſens que l'Abeille commune, cela eſt cependant vraiſemblable; la nourriture et le logement ſont bien la cauſe première de toutes les différences que l'on remarque dans leur inſtinct; mais ils n'ont fait proprement que développer des organes de ſens différens, et des membres plus ou moins, parfaits, dans des inſectes originairement ſemblables; des ſens nouveaux ont fait naître chez les uns des plaiſirs et des beſoins que les autres ne connoîtront point, les organes s'y ſont prêtés, les membres les ont ſatisfaits.

Chez

Chez les autres peut-être de nouveaux ſens ont-ils produit cet inſtinct qui répond ſi bien à nôtre raiſon? Il a exigé des travaux; ces travaux ont été exécutés par les membres doués d'une adreſſe infinie, et c'eſt ainſi que tout ſemble être dirigé chez ces petits animaux.

La nature n'a pas eu un auſſi grand effort à faire avec les Bourdons; il y a bien moins de différence entre les mœurs des mères Bourdons, comparées à celles de leurs ouvrières, qu'entre l'inſtinct des Abeilles et celui de leurs reines.

Car, comme je l'ai dit, la mère d'une famille de Bourdons peut faire tous les ouvrages qui ſe font chez elles, et il n'en eſt pas de même dans les ruches d'Abeilles.

Ainſi la nature n'a eu que peu de peine à convertir des vers de femelles en vers d'ouvrières, et encore moins à en faire des petites femelles.

La ponte et les paſſions de ces petites femelles doivent attirer particulièrement nos regards; voici de quelle manière je découvris leur fécondité, et les détails de leur ponte.

Je ne les diſtinguai point d'abord des ouvrières, tant elles leur reſſembloient par leurs caractères extérieurs, de ſorte que je fus très ſurpris lorſque je les vis pondre pour la première fois. Je tranſcrirai ici mon journal des derniers jours de Juillet, et des premiers du mois d'Aout.

Copie du Journal de Juillet 1796.

Le 26. Le vent a renverſé la cloche qui étoit ſur ma fenêtre, et le nid de Bourdons qu'elle renfermoit eſt tombé, avec tous les inſectes qui l'habitoient.

Les ouvrières ſont revenues à la place où étoit leur nid; je leur ai donné une autre cloche, pour les garantir de la pluie; je ne leur ai point

point rendu leur gâteau, qui étoit déjà rongé par les teignes depuis fort long tems.

La mère n'eſt point revenue, et je l'ai cherché vainement autour du gâteau.

Le 27. J'ai donné du miel aux Bourdons refugiés; ils commencent déjà à faire de la cire.

Le 28. Ils continuent à faire de la cire.

Le 29. Ils ont conſtruits un pot-à-miel ſur le bord de la carte où je mettois leur miel.

Le 30. Un des plus petits individus de la peuplade, à mon grand étonnement, vient de conſtruire une cellule de cire, où il a pondu deux œufs, en faiſant ſortir ſon aiguillon au travers de la cellule.

J'ai de la peine à le diſtinguer des autres, ſoit par la taille, ſoit par la couleur, ſoit par la forme de ſon corps; ſeulement ſon agitation ſemble plus grande, et il empêche les ouvrières de s'approcher de ſa cellule.

Cependant, il n'eſt pas toujours le plus fort, et d'autres montent ſur l'alvéole; ceux-ci ne cherchent point à enlever les œufs qui y ſont renfermés, ce qui eſt fort ſingulier; au contraire, ils les ſoignent avec plus de zèle que celui qui les a pondu, et les défendent auſſi contre les autres Bourdons.

Le 31. Seconde ponte du même Bourdon; mêmes circonſtances qu'hier.

1 Août. La petite femelle continue à pondre; elle bâtit toutes ſes cellules lés unes à côté des autres.

Le 2. Continuation ſans aucune différence; je remarque ſeulement que les Bourdons n'ont point apporté ni préparé de pollen dans les cellules où vient de pondre la petite femelle.

Le 4. Les Bourdons ont apporté du pollen ſous la cloche; ils l'ont mis au fond d'un nouveau pot-à-miel; on les voit aller et

venir ſur le tas des cellules, et faire des creux en divers endroits, comme lorſqu'ils nourriſſent les vers. C'eſt qu'en effet quelques vers ſont éclos.

Le 5. Les Bourdons nourriſſent encore un peu les vers; ils n'ont point apporté de pollen aujourd'hui.

Mon journal du onze m'apprend que ces vers périrent à défaut de nourriture, peut-être parceque les Bourdons s'étoient accoutumés à la ration de miel que je leur donnois chaque jour; ils ne vouloient plus aller chercher leurs vivres à la campagne, en ſorte qu'ils negligeoient entièrement d'apporter la nourriture des vers; j'y vois auſſi, que lorſque les Bourdons n'apportoient point de pollen, ils ne nourriſſoient point leurs petits, et que lorſque je leur en avois donné, ils leur en faiſoient part ſans balancer.

Je vis enfin le tas de cire diminuer chaque jour, et de nouveaux pots conſtruits à côté des premiers.

J'ignore ce que les Bourdons firent des petits vers; il n'en reſtoit qu'un lorſque je leur enlevai la carte ſur laquelle ils avoient été pondus.

Mon journal du mois d'Août m'apprend qu'une autre petite femelle d'une eſpèce de Bourdon différente pondit auſſi dans ſon nid.

Mais je raconterai en détail ce qui s'y paſſa le ſeptième jour du même mois; c'étoient des Bourdons rouges et noirs.

Le nid étoit fort peuplé; il poſſédoit un bon nombre d'ouvrières, pluſieurs jeunes femelles de la grande taille nouvellement transformées, l'ancienne mère, et beaucoup de mâles.

Parmi les ouvrières il y avoit aſſurément des petites femelles, que j'aurois reconnues ſi j'avois ſçu leur trouver un caractère diſtinctif; mais les ſcènes ſuivantes prouvèrent ce fait d'une manière indubitable.

Le

Le 7 du mois d'Août à minuit j'appercus une grande agitation dans le nid; il s'agiſſoit d'une ponte extraordinaire.

Pluſieurs Bourdons étoient occupés à faire une cellule de cire; cette cellule étoit bien moins grande que les alvéoles ordinaires, et ſes bords étoient bien moins élevés ; ils y travailloient encore quand la femelle, mère de la peuplade, vint ſur la cellule, les chaſſa, et donna quelques coups de dents au bord de la petite coupe; elle fut contrainte de ſe retirer à cauſe de la fureur de quelques-uns d'entr'eux, qui s'approchèrent d'elle en battant des ailes, et qui la pourſuivirent juſques au bas du nid: ils achevèrent alors la cellule; et quand ils lui eurent donné les dimenſions convenables, je vis l'un d'entr'eux s'établir ſur l'alvéole, comme s'il eut eu l'intention de pondre: un autre y inſerra de même l'extrêmité de ſon corps ; et tandis qu'ils étoient ainſi occupés à pondre conjointement, je vis revenir la vieille mère: le bruit et le battement de ſes ailes annonçoient d'avance ſa colère; elle ſe jetta ſur l'une des petites pondeuſes, lui monta ſur le dos, et réuſſit à la chaſſer à coups de dents: elle chaſſa l'autre de la même manière.

Dès que la cellule fut vacante elle y enfonça ſa tête, prit les œufs qui venoient d'être pondus, et parût les manger avec avidité.

Bientôt l'une des petites femelles revint ſur la cellule, lui rendit ſa première forme, et ſe mit à pondre: la vieille mère revint encore avec ſa jalouſie ordinaire, chaſſa la pondeuſe, et enfonça ſa tête dans la cellule: j'ignore ſi la petite pondeuſe crût avoir pondu, ou ſi elle n'apperçut pas le larcin de la vieille femelle, mais le fait eſt, qu'il ne reſta point d'œufs dans la cellule, et qu'elle la referma dès que la femelle ſe fut retiré: elle s'écarta pour chercher de la cire, et fermer plus ſoigneuſement ſa cellule ; mais d'autres individus, qui étoient vraiſemblablement auſſi de petites femelles, vinrent auſſitôt, et lui rendirent ſa propre forme.

Je crus reconnoître alors cette petite pondeuſe que j'avois pris ſur le fait le 2 d'Août ; elle étoit la plus grande des petites femelles de ce nid là ; elle monta ſur la cellule, élargit ſon orifice, éleva ſes bords, ſe mit à pondre, et fit deux œufs devant moi. Peut-être en eut-elle fait d'avantage ſur la vieille mère, qui revint en battant des ailes, la pouſſa hors de la cellule, la chaſſa bien loin, et finit par manger ſes œufs. Celle-ci fut aidée dans ce travail par une des petites femelles dont j'ai parlé plus haut, et que j'avois marquée avec de la couleur lorſqu'elle étoit occupée à pondre dans la même cellule.

La petite femelle qui venoit de pondre reparut à ſon tour avec tous les ſignes de la colère ; elle chaſſa toutes les ouvrières de deſſus le gâteau, referma ſa cellule quoique vide, et fit la garde autour d'elle avec une activité étonnante : elle ſe coucha ſur ſon ouvrage ; et quand je la vis bien reſolue à ne plus pondre, je l'enlevai avec la vieille mère, et je les enfermai dans un poudrier pour ſavoir ſi tous les Bourdons qui ſe mettroient ſur ces cellules étoient de véritables pondeuſes : mais je ne pûs pas m'en aſſurer, parceque les ouvrières détruiſirent cet cellule; et comme il étoit trois heures du matin, je me retirai, et je renvoyai au lendemain la ſuite de mes obſervations.

A ſix heures du matin il ne reſtoit plus de veſtige de la cellule, et je rendis à leur nid les deux individus que j'avois fait priſonniers : ce jour là, à ſix heures du ſoir, l'agitation recommença ; une large et épaiſſe cellule ſe faiſoit remarquer ſur les gâteaux; la vieille mère, qui ne pondoit plus depuis fort long tems, et qui étoit devenue ſtérile à force de pondre, étoit montée ſur la cellule ; elle en déchiroit les bords avec acharnement, ſans avoir pour but d'enlever les œufs qu'elle pouvoit contenir, car elle étoit ouverte, et d'ailleurs elle n'en contenoit pas un.

C'étoit donc par jalouſie, et non pas par beſoin.

Il m'importoit de ſavoir ſi les œufs de ces petites femelles viendroient à bien; et pour ſatisfaire ma curioſité, j'enlevai pour la ſeconde fois la vieille femelle, et j'obſervai encore les manœuvres des individus qui reſtoient dans le nid.

L'agitation monta à ſon comble.

Les petites femelles ſe pourſuivoient les unes les autres; trois ou quatre d'entr'elles vouloient pondre à la fois; elles ſe diſputoient la cellule avec une rage étonnante: celle qui parvenoit à la poſſéder un inſtant pondoit quelques œufs, et devenoit l'objet de la jalouſie des autres ; celles-ci ſe jettoient ſur elle, harceloient le bout de ſon ventre, et la faiſoient enfin déguerpir à coups de dents.

La plus groſſe d'entr'elles parvenoit toujours à s'emparer de la cellule; mais elle n'en pouvoit jouir que foiblement, car les autres s'acharnoient à l'en chaſſer; et comme elle ſe ſentoit la plus forte, elle ſe retournoit, et les précipitoit au bas du gâteau avec la rage des vieilles mères: quand elle avoit pondu, elle étoit obligée de garder ſa cellule—plutôt peut-être par jalouſie que par amour pour ſes petits.

Cette ſuite d'obſervations fut dérangée cette année là par les teignes; elles mangèrent les cellules où les petites femelles avoient pondu, et je ne pus ſavoir de quel ſexe auroient été les individus qui en ſeroient ſortis, mais depuis lors j'ai mis tous mes ſoins à le découvrir.

Dès le 21 de Juin de l'année 1797 les petites femelles m'offrirent les mêmes ſcènes: elles furent quelquefois encore plus animées; le 22 j'enlevai la mère ; le 23 je la replaçai dans ſon nid ; elle paroiſſoit robuſte et bien portante, mais un quart d'heure après je la trouvai expirante ſous le gâteau. Ses rivales continuèrent à pondre pendant plus d'un mois. Le 26 de Juin de petits vers naquirent dans une cellule où elles avoient pondus le 21. Le 4 Juillet ces vers filèrent

filèrent leurs coques; le 6 ces coques changèrent de forme; le 18 leurs habitans les ouvrirent pour en ſortir; je les obſervai avec ſoin, et je les reconnus tous pour des mâles.

Les grandes et jeunes femelles ne ſe mêloient pas aux ſcènes ſingulières dont on a parlé, et n'étoient point en butte à la jalouſie des petites femelles. Tandis que la mère commune en étoit quelquefois la victime, la nature, en privant les jeunes femelles de la faculté de pondre dans le nid où elles étoient nées, les ſouſtrayoit à la fureur toujours dangereuſe de leurs rivales; et c'étoit peut-être à cette ſeule précaution qu'étoit attachée la conſervation de l'eſpèce.

Les mâles de la dernière ponte fécondoient les grandes femelles pendant ce premier période de leur vie: celles-ci deſtinées à fonder de nouvelles colonies n'étoient cependant pas inutiles à celles qu'elles habitoient encore; elles travailloient comme de ſimples ouvrières dans le nid où elles avoient pris naiſſance; elles s'occupoient comme elles à recolter le miel et le pollen; je les ai vues chargées de pelottes à leurs jambes, vuider dans les pots-à-miel celui qu'elles avoient recueilli ſur les fleurs; elles faiſoient de la cire, elles ſavoient la ſculpter, elles devoient même ſavoir conſtruire des cellules quand elles auroient à commencer de nouveaux nids; mais avant ce terme elles ne faiſoient jamais d'alvéoles.

Elles paroiſſent donc ignorer l'art de bâtir, et cette faculté reſte ſuſpendue juſques au retour du printems: à cette époque le ſentiment de leur maternité leur rend tout leur inſtinct, et reveille en même tems chez ces jeunes mères l'idée des œufs qu'elles ont à pondre, et celle des cellules dans leſquelles ils doivent être dépoſés.

Si les ouvrières conſtruiſent quelquefois des cellules, ce n'eſt que lorſqu'elles ont été commencées par la mère commune, ou par de petites femelles; elles ne les conſtruiroient peut-être jamais d'elles-mêmes.

CHAPITRE XIII.

Conjectures.

ME permettra-t-on de hazarder quelques conjectures ſur l'origine des gâteaux, ſur la formation des premières cellules, et ſur les premiers travaux de la femelle lorſqu'elle eſt encore ſeule à l'ouvrage?

Si l'on doit croire que la Nature ait donné aux inſectes des loix uniformes pour diriger leur conduite, je pourrois ſuivre l'analogie ſans trop m'écarter de la vraiſemblance.

La Nature ſemble déjà avoir tracé une ligne qu'il ne faut que continuer pour arriver à la vérité; un plan qu'il n'y a qu'à ſuivre, et ce plan on vient de le lire dans les obſervations précédentes.

La mère Bourdon, après avoir creuſé d'une manière quelconque la cavité dans laquelle elle a poſé les fondemens de ſon nid, aura amaſſé dans le fond du creux une aſſez grande quantité de cire pour former une cellule; car elle a, comme je l'ai dit, la faculté de produire cette matière en plus grande abondance que les ouvrières; elle aura façonné cette petite maſſe en forme de coupe; elle aura été ſur les fleurs chercher des pouſſières d'étamines; elle les aura placées dans le fond de l'alvéole, et ce ſera le premier aliment de ſes petits.

Ce n'eſt qu'après ces préliminaires qu'elle y aura dépoſé ſes œufs; ſelon ſon uſage, elle en aura pondu ſept ou huit à l'aide de ſon aiguillon; et pendant ſon travail elle n'aura point été inquiète pour leur ſureté, puiſqu'ils n'auront pas été expoſés à la voracité des autres Bourdons.

Des vers ſeront éclos; ils ſe ſeront nourris des proviſions qu'on avoit préparé dans leurs cellules; ils les auront bientôt conſommées; leur corps aura pû prendre de plus grandes dimenſions avant de remplir le vide cauſé par la diminution du pollen; et leurs forces s'étant accrues avec leur grandeur, ils auront fait éclater la pellicule de cire qui les enfermoit.

La

La femelle aura pris quelques brins de cette matière ſur la ſurface de l'alvéole, et aura joint, au moyen d'une bande de cette ſubſtance, les deux hémiſphères creux dans leſquels la cellule aura été transformée.

Le logement des vers aura donc été augmenté au moyen de l'effort qu'ils auront fait pour le rompre, et par les ſoins de leur mère.

Elle doit alors avoir été obligée de les nourrir chaque jour, car ils ne devoient plus avoir de pollen dans leur magazin. Ces petits ayant pris tout leur accroiſſement, chacun d'eux ſe ſera conſtruit ſous la cire un logement à part, dont les lambris auront été de tentures de ſoie.

La mère aura peut-être alors réuni la cire qui couvroit les nouvelles loges de ſes petits, et l'aura ſculptée en cellule pour y pondre de nouveaux œufs.

Mais remarquons déjà que voilà un gâteau tout formé; les loges de ſoie, qui d'abord étoient applaties, ſe feront redreſſées, et auront pris la forme d'un œuf, et les petits qu'elles renferment à cette époque auront ſubi toutes leur métamorphoſes.

C'eſt dans cet état que j'ai trouvé au mois de Juin un petit gâteau de Bourdon dans une cavité ſouterraine; ce nid n'étoit habité que par trois individus parfaits, une mère et deux ouvrières.

Ce gâteau n'étoit compoſé que de huit coques réunies; les deux coques qui occupoient le milieu étoient ouvertes, les ſix autres étoient encore fermées; on voyoit ſur ſes bords deux maſſes de cire qui contenoient des œufs.

Ce gâteau entre parfaitement dans le plan que je viens de crayonner; il eſt d'accord en tout avec les idées que j'ai données pour des conjectures; il ſemble prouver que je ne me ſuis point écarté de la vraiſemblance.

On conçoit facilement que de nouvelles cellules conſtruites ſur les premières coques donneront lieu à de nouveaux gâteaux, et que les

premières

premières coques ouvertes ſerviront auſſi les premiers de pots-à-miel à la famille.

Voilà donc la femelle en ſociété, et le lecteur exactement au point d'où il étoit parti. La route que je lui ai fait parcourir conjecturalement me paroit aſſez naturelle pour l'adopter, en attendant que de nouvelles obſervations nous apprennent ſi c'eſt là réellement la marche de la Nature.

La ſcène change quand les premières mouches ſont transformées; la mère, qui avoit vécu juſqu'alors dans une ſolitude profonde, ſe voit entourée de mouches induſtrieuſes auxquelles elle a donné la vie. Elle n'eſt plus obligée d'aller aux champs pour recolter le miel et le pollen; elle eſt diſpenſée de ces courſes toujours dangéreuſes; ſes enfans adultes ſe chargent auſſi de la nourriture des vers, de la cloture et de la défenſe du nid; et s'ils lui laiſſent le ſoin de perpétuer l'eſpèce, ils l'aident encore à conſtruire et à perfectionner les berceaux de ſes petits.

L'été offre des tableaux plus piquans à l'obſervateur. Le privilège de pondre n'appartient plus excluſivement à la mère commune; un peuple de petites femelles paroit alors; elles lui diſputent ce droit qu'elles partagent avec elle. Elles ſe chaſſent les unes les autres, ſe combattent ſouvent, ſe tuent quelquefois, et donnent le jour à un grand nombre de mâles.

Ceux-ci fécondent les grandes femelles qui naiſſent à la même époque, et les dehors du nid ſont le théâtre de leurs amours. Lorſqu'ils ont aſſuré la conſervation de l'eſpèce, ils périſſent, et l'automne voit auſſi diſparoître la vieille mère, les ouvrières, et les petites femelles.

Les jeunes femelles de la grande taille ſurvivent ſeules à toute la peuplade, mais elles s'enferment dans un tombeau qu'elles ont creuſé dans l'arrière ſaiſon; les premiers froids les engourdiſſent;

elles bravent dans cet état les rigueurs de l'hiver; elles ne ſortent de leur léthargie qu'au retour du printems, et lorſqu'elles peuvent trouver ſur les fleurs le miel et le pollen qui ſervent à les nourrir. Elles ne ſentent donc les beſoins que lorſqu'elles peuvent les ſatisfaire, et ce dernier trait n'eſt pas le moins intéreſſant de leur hiſtoire.

XX. *Bota-*

XX. *Botanical Characters of four New-Holland Plants, of the Natural Order of Myrti.*

By James Edward Smith, M.D. F.R.S. P.L.S.

Read July 7, 1801.

SINCE the publication of a paper in the third volume of the Linnean Society's Tranſactions, the aim of which was to fix the botanical characters of ſeveral genera and ſpecies of the natural order of MYRTI, hitherto not well determined; I have become acquainted with a few more of the ſame tribe, four of which it is my deſign to deſcribe at preſent. The number might appear too inconſiderable to be the ſubject of a paper, nor ſhould I, ſcarcely, have offered them in this form to the Society, were it not as a kind of neceſſary ſupplement to the former treatiſe; and had I not a few particular obſervations to propoſe reſpecting one of the plants.

3. * LEPTOSPERMUM *grandifolium*, foliis lanceolatis mucronatis ſubquinquenervibus ſubtùs pubeſcentibus, calycibus villoſis: dentibus membranaceis coloratis.

A ſingle ſpecimen of this new ſpecies of *Leptoſpermum*, gathered by Dr. White in New South Wales, has been communicated to me by A. B. Lambert, Eſq. It is much larger than any other I have ſeen of the genus, eſpecially the leaves, which are above an inch long, and near a quarter of an inch broad. Their form is lanceolate, tapering more towards the baſe than towards the extremity, and they are tipped with a ſmall prominent, ſharp point; their margin is en-

tire, a little revolute; upper ſurface ſmooth and ſhining; lower paler, opake, downy, punctate, marked with two obſolete longitudinal ribs on each ſide of the principal one. Flowers terminating the ſhort lateral branches, ſolitary, ſeſſile, ſurrounded with a few leaves; white, large and handſome. Calyx clothed all over with white ſilky down; its teeth membranous, whitiſh, leſs ſilky on the inſide, moſt ſo externally about the tip. The germen is found to conſiſt of only five cells; otherwiſe the appearance of the plant, and large ſize of all its parts, would have led me to ſuppoſe it a *Fabricia*, nearly allied to Gærtner's *myrtifolia*. As a *Leptoſpermum* it ſhould be inſerted between the third and fourth ſpecies, being next akin to the *lanigerum*.

5. * L. *imbricatum*, foliis obovatis imbricatis enervibus, ramulis calycibuſque glabris; dentibus membranaceis coloratis carinatis.

Gathered near Port Jackſon, New South Wales, by the late Mr. David Burton, and communicated to me by the Rt. Hon. Sir Joſeph Banks. It is cloſely allied to the fifth ſpecies, *L. parvifolium*, but differs at firſt ſight in the imbricated appearance of its numerous leaves on the long lateral branches; and the flowers will be found on examination totally diſtinct, being not half the ſize of thoſe of *L. parvifolium*, ſtanding two or three together about the extremity of each branch, not ſolitarily: their calyx moreover is in every part perfectly ſmooth, and its teeth ſharply carinated, which in the other are only a little convex, and entirely deſtitute of any keel.

4. * MELALEUCA *ſquarroſa*, foliis ſparſis oppoſitisve ovatis muticis quinquenervibus, floribus lateralibus, dentibus calycinis lævibus.

M. ſquarroſa. *Donn. Hort. Cant. ed.* 2. 101.

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I am indebted to the Rev. Mr. Davies, F. L. S. Vice-Maſter of Trinity College, Cambridge, for ſpecimens of this ſhrub, which was raiſed in the Botanic Garden of the Univerſity by Mr. Donn, from ſeeds brought from Port Jackſon, and flowered in 1799. It ſhould ſtand next to the *M. ſtypheloides*, to which its leaves bear ſome reſemblance; but they are neither twiſted nor pungent, neither have they more than five, or at moſt ſeven ribs; they are alſo more inclined to be oppoſite than in that ſpecies. The flowers are white, encircling the branches in longiſh cluſters. Calyx-teeth blunt and without nerves, as in moſt of the other ſpecies, and totally unlike the ribbed acuminated teeth of *M. ſtypheloides*. Stamina collected together into bundles, but imperfectly, and never to any conſiderable diſtance from their baſe, ſo that it would ſcarcely be taken for a *Melaleuca* till the filaments in decay are found to fall off (for the moſt part) in cluſters. The ſtigma is ſimple, as in *Metroſideros*.

The very imperfect connection of the ſtamina in this plant leads us to remark how little the diſtinction between *Melaleuca* and *Metroſideros*, and conſequently even the character of the Linnean claſs *Polyadelphia*, are founded in nature. Moſt plants indeed, of that claſs, like moſt ſpecies of *Melaleuca*, have the filaments ſo ſtrictly united, for a conſiderable part of their length, into ſeveral (moſtly three or five) *phalanges* or bundles, and thoſe bundles fall off ſo entire, that the character derived from ſuch a circumſtance ſeems no leſs natural than convenient for the ſyſtematic botaniſt. In the *Melaleuca nodoſa*, on the contrary, the union of the ſtamina is continued but a little way from the baſe, and it is even more ſlight in the plant now before us, many of the filaments being quite ſimple, and unconnected with their neighbours. The caſe is the ſame in the genus *Citrus*, of which Linnæus could not but be aware when he eſtabliſhed this claſs, and indeed he alludes to the variableneſs of the character in his *Genera Plantarum* in deſcribing *Citrus*. Neither is

this

this character, ſlight as it is, connected with any peculiarity of habit by which a *Melaleuca* can be known from a *Metroſideros*; nor, I believe, would any botaniſt venture to gueſs at a *Melaleuca* without ſeeing the ſtamina, in which the only peculiarity of the genus reſides. What then is to be done, when even this peculiarity ſeems eluding our graſp? We can only retain the genus as an artificial one, along with many other ſuch, till the ſcience be arrived at a greater degree of perfection; keeping, in the mean time, *natural orders* in view as the grand object of our ſyſtematic inquiries, and cheriſhing every truly *natural genus* as a fixed point, on which we may found the principles of future diſcoveries.

1. * EUCALYPTUS *marginata*, operculo conico magnitudine calycis, umbellis lateralibus, foliis ovatis margine incraſſatis.
E. marginata. *Donn. Hort. Cant. ed.* 2. 101.?

Mr. Aiton favoured me with ſpecimens of this plant three years ago from Kew Garden. The ſeeds were brought from Port Jackſon. Its leaves agree very much in form with thoſe of *E. robuſta*, (next to which it ought to be placed,) but the footſtalks are ſhorter, veins more prominent, and the margin more thickened, ſomewhat cartilaginous, and reddiſh. The umbels are ſolitary, axillary, and ſimple. Flowers ſcarcely one-third of the ſize of the *robuſta*, and their covers are neither broader than the calyx, nor longer; neither are they contracted in their middle. The flowers much reſemble thoſe of my *E. pilularis*, but the leaves are totally different.

XXI. *Addi-*

XXI. *Additional Obſervations on ſome remarkable Strata of Flint in the Iſle of Wight, in a Letter from Sir Henry Charles Englefield, Bart. F.R.S. to John Latham, M.D. F.R.S. and L.S. of Romſey.*

Read July 7, 1801.

DEAR SIR,

I FEEL much flattered by the notice taken of my Paper* on the Chalk Pits of the Iſle of Wight by the Linnean Society; and as I wiſh to render my account of the very curious appearances obſerved by me in them as perfect as I can, the following additional obſervations on the ſubject, made during a ſecond viſit laſt year, are, by your favour, ſubmitted to the Society.

The pits I laſt year inſpected are as follow, beginning from the eaſt.

Brading pit, which is at the eaſtern point of the great ridge, where the valley of Brading Haven interſects it, and ſeparates it from the Yaverland hill, which terminates in the ſea at Culver and Bembridge.

A road cut into the chalk above Knighton.

Aſhey-down pit, about three miles eaſt of Newport.

A pit very near to, and ſouth of, Cariſbrook caſtle.

The cliffs and caves of Freſhwater bay, both eaſt and weſt of the valley, which interſects them entirely, and runs from Freſhwater to Yarmouth.

The Yaverland chalk is, therefore, the only part which I have

* P. 103.

not examined, and little doubt can be entertained of its ſimilarity to the reſt of the range, to which it evidently belongs.

In Brading pit ſome flints appear in detached nodules, and theſe are ſound and unbroken.

The inclined ſtrata of flint are viſible, but not to advantage, owing to the manner of working the pit. In theſe ſtrata the flints are univerſally ſhattered, ſome into abſolute powder, others into groſſer powder and fragments mixed. But beſides theſe ſtrata, the chalk in this pit is divided by vaſt perpendicular fiſſures, as ſmooth as plaiſter walls, and in ſome of theſe fiſſures flint has formed, which appears broken like that in the ſtrata.

The road above Knighton only juſt cuts into the chalk ſtratum, but all the flints viſible in the banks are extremely ſhattered.

The pit at the weſt end of Aſhey-down, near two large barrows, is the moſt extenſive and ſatisfactory of any I have ſeen. The perpendicular face of the chalk, where worked, is not leſs than fifty or ſixty feet, and its direction is at right angles to that of the ſtrata, and parallel to their line of dip:—of courſe, they are ſeen to very great advantage. The ſtrata ſeem to dip northward more rapidly than in any other place where I could obſerve them. The angle of inclination is from 75 to 80 degrees. There are not layers of flint between every layer of the chalk. Some of the chalk is peculiarly ſolid, and riſes in very large maſſes, affecting a cubic form. Their ſolid vein is from twenty-five to thirty feet thick, and is in ſtrata from three to four feet. In all this ſolid part there are very few flints.

Both above and below this harder bed (ſpeaking of the original poſition of the ſtrata) the chalk is ſofter, and has more flints in it. The ſtratified flints in this pit are full as much ſhattered as any I

had ſeen. The nodules are not at all broken. Many of the ſtratified flints are much defaced in this pit by an admixture of pyrites, ſo as to be quite opaque, like a coarſe jaſper; and theſe flints are much ſofter than the others, as is always the caſe in the impure flint.

In the chalkpit near Cariſbrook the ſtrata are not ſo viſible as in the pit north of the caſtle, (deſcribed in the firſt paper,) but the flints are to the full as finely, though perhaps not ſo generally, broken. In one flint I obſerved, that though it lay in its bed undiſturbed, chalk, as if in a fluid ſtate, had run into one of the fiſſures. Every appearance in this pit indicates that the chalk, ſince its ſtratification, has received a moſt violent ſhock.

The chalk at Freſhwater bay appears in high perpendicular cliffs, particularly on the weſtern ſide of the bay. Both on the eaſt and weſt the ſtrata dip northward near 80 degrees, and the dip ſeems to run eaſt and weſt very regularly. The weſtern cliff has a very regular and perpendicular face to the eaſtward; and here the parallel direction of the ſtrata, each ſeparated by a thin line of black flint, preſents a moſt curious appearance. The flint here is often found in thin plates of conſiderable extent, ſometimes not above an inch thick, and ſeems formed from each ſide of the ſpace which it fills; as the exterior parts (or thoſe neareſt the chalk) are the pureſt and blackeſt, and it is gradually whiter towards the middle, where there is often a line of ſoft chalk included between the two plates of flint. All the ſtratified flints are more or leſs ſhattered, and ſome are reduced to very fine powder. The cave at Freſhwater, which is really a beautiful as well as a curious one, is formed by the action of the ſea on theſe nearly vertical ſtrata. They are of different hardneſs, and all interſected with fiſſures at right angles to the ſtrata. When the ſea acts on and wears away a ſoft ſtratum, a gallery is formed, and

the upper parts of the ſtratum between fiſſure and fiſſure drop out, much in the ſame way as bricks are apt to do out of the flat arch over a window; the harder contiguous ſtrata ſerve as walls to the gallery, but are by degrees perforated in different parts, and become irregular pillars, ſupporting the vaſt weight of the hill above, until the action of the ſea weakens them ſo far, that they fall, and a part of the face of the hill goes with them: ſo that the cave is conſtantly, although ſlowly, changing its form.

Large maſſes of the harder ſtrata, defended by their flint coating, alſo ſtand up in the bay as inſulated rocks of different ſhapes, and much reſembling the Needle rocks, which are exactly of the ſame materials, and formed by the ſame proceſs. In this part of the chalk ſtratum I ſaw ſeveral foſſil remains, which I had ſought in vain in the pits I had viſited. One was ſingular. It had the appearance of part of a very large ſhell, regularly ſtriated, and almoſt flat. I have often ſeen ſmall fragments apparently of a ſimilar ſhell, in chalk, but never a large piece. It was ſo firmly fixed as not to be removed without a chiſel; which I had not.

To theſe obſervations on the chalk of the iſland I muſt add, that this whole range, although really chalk, is much harder than the chalk of the South downs; inſomuch that the carpenters cannot uſe it for drawing lines, but import chalk for that purpoſe from Portſdown hill, above Portſmouth. They alſo call the iſland chalk by the name of marle, which is, however, only the Breton name for chalk, and appears in many compound names, ſuch as *Marl-borough* on the Wiltſhire chalk hills, and the very ſignificant one of *Albemarle*, or white chalk.

As I made ſome further obſervations on the ſouthern range of hills which form the back of the iſland, I will treſpaſs on your patience a little longer, particularly as they in ſome degree contradict,

or

or rather correct, what I had advanced on that ſubject in my former letter.

When the northern front of thoſe hills is viewed from Aſhey down, the ſtratum of ſtone mentioned in my former letter, as lying directly under the chalk of St. Catharine's and Dunnoſe hills, appears every where to maintain an horizontal poſition; and ſo in its general diſpoſition, particularly in its northern front, it certainly does; but juſt behind the village of Ventnor, the ſtratum entirely diſappears, as if it had been ingulphed in a great chaſm; and a deep and narrow valley runs winding into the chalk hill of St. Boniface, though it does not penetrate through it, which ſeems the remains of the fiſſure into which the ſtone had ſunk.

The appearances of the great ſtone ſtratum, from Niton eaſtward to Ventnor, are noted as follows in the journal made on the ſpot:

On an attentive inſpection of the ſtrata of the under cliff, it appears that the great ſtratum of rugged and laminated ſtone, which firſt appears at the weſt ſide of St. Catharine's, and, thence ranging eaſtward, forms the front of the cliffs overhanging the Underway, dips in its ſouthern face gently to the eaſtward. The cliffs at Mirables are much higher above the ſea than thoſe of St. Laurence; and from thence they decline till at the opening in the hill above Ventnor they totally diſappear. A ſmall crag juſt peeps out of the eaſtern face of this dell, and the whole hill of St. Boniface is, as far as can be ſeen, compoſed of chalk. As, however, this, like all other chalk hills, is in the ſtate of a ſteep ſlope covered with turf, perhaps by digging into its face the ſtony ſtratum might be diſcovered. It is alſo to be obſerved, that the chalk, which is not viſible above the rock at Mirables, begins to appear ſoon after, and grows gradually thicker as it proceeds eaſtward. At St. Laurence, it forms a thick cap to the rocks; and at Steephill ſhute its thick-

neſs is very much increaſed, and ſoon after nothing but chalk appears in St. Boniface's hill. In what form the rock re-appears at Dunnoſe to the eaſt of St. Boniface, I have had no opportunity of examining.

I ſhould not, dear Sir, trouble you with theſe defective obſervations, but that every notice, however imperfect, may be of uſe when connected by future obſervations, and that they may ſerve as a ſtimulus to other travellers who often go over this beautiful line of country, to turn their attention to its ſingular natural phænomena.

I ſend you two ſpecimens of the broken flints; one from above Brading, the other from near Cariſbrook; but the tickets are miſlaid, and I am not ſure which is which.

I remain, &c.

Tilney Street,
May 26, 1801.

XXII. *Deſcrip-*

XXII. *Deſcription of a new Species of Viola. By Thomas Furly Forſter, Eſq. F. L. S.*

Read July 7, 1801.

VIOLA CONCOLOR.

VIOLA caulibus erectis, foliis lato-lanceolatis ſtipuliſque lanceolato-linearibus integerrimis;

Habitat in uliginoſis Americæ Septentrionalis. ♃

DESCRIPTIO.

Radix fibroſa, ramoſa, alba, perennis.

Caulis herbaceus, erectus, flexuoſus, ſulcato-anguloſus, ſimplex, hiſpidus, pedalis et ultra.

Folia alterna, lato-lanceolata, acuminata, integerrima, rugoſa, ciliata, dilute virentia; variant ſæpe argute dentata aut lacera.

Petiolus breviſſimus, ſemiteres.

Stipulæ quatuor; duæ majores, duæ minores; lineari-lanceolatæ, arcuatæ, integræ, ciliatæ.

Pedunculi duo, minimi, ex axillis foliorum; unus ferens florem abortivum.

Bracteæ duæ, minimæ, lineares, obtuſæ.

Flores

Flores parvi, dilute virides, plantæ concolores.

Calyx: Perianthium pentaphyllum, concavum, hamoſum.

Corolla: Petala quinque viridia:

duo *ſuperiora* minima, linearia, recurva, integra;

duo *lateralia* linearia, dentata, recurva;

infimum bipartitum.

Calcar breviſſimum, obtuſum.

Stamina quinque, ſubulata, breviſſima.

Antheræ viridi-purpureæ, baſi bifidæ.

Piſtillum breve.

Stigma non urceolatum, ſed hamoſum, perforatum, duplo longius antherâ.

OBSERVATIONES.

Culta rariſſime floret. In horto meo jam annos plus quatuordecim exſtitit; at cum ſæpius ex America repetita eſſet, bis ſolummodo, primum duntaxat anno, hoc tanto temporis ſpatio floruit. Nuſquam alias vireſcentem niſi in Horto Regio Kewenſi vidi. Specimen ſiccum inde decerptum in Herbario egregio Dom. Joſ. Banks, Bart. exſtat, ſed nondum in aliquo (quod ſciam) de hac re ſcriptore hæc ſpecies notata eſt; nec pro certo habeo quod vere ſit Viola, forſan cum multis aliis ſub novo genere melius diſtinguenda.

Cum omne hoc genus (Violam) ſemper magno ſtudio excoluerim, ſpecies haud minus ſexaginta notavi; et cum per otium licebit, libenter genus, nunc plurimis mendis laborans, expedire conabor. Duas tantum obſervationes ſpeciminis loco huc afferam.

Viola lanceolata Gmelin ex Siberia deſcripta non eſt eadem quam ſub eodem nomine Kalm ex Canada propoſuit. Hæc foliis peranguſtis lanceolatis nitidis, radice fibroſa, ſtolonifera; illa foliis ovato-lanceolatis pubeſcentibus, radice fuſiformi, acaulis.

Viola grandiflora hortorum non eſt eadem quæ *Viola grandiflora* Linnæi, ſed omnino ſpecies nova, cui *Violæ Pallaſii* nomen dare velim, ut a Pallas primo in Siberia inventæ.

EXPLICATIO TAB. XXVIII.

Fig. 1. Planta magnitudine naturali.
2. Calyx.
3. Petala ſuprema.
4. Petala lateralia.
5. Petalum infimum.
6. Stamen.
7. Piſtillum.
8. Antheræ.
9. Anthera.
10. Capſula.
11. Semen.

XXIII. *Deſcription of the Fruit of Cycas revoluta. By James Edward Smith, M.D. F.R.S. P.L.S.*

Read November 3, 1801.

THE *Cycas revoluta, Thunb. Fl. Japon.* 229, *Ait. Hort. Kew. v.* 3. 475, having, for the firſt time in England, produced fruit in the collection of the Honourable and Right Reverend the Biſhop of Wincheſter, at Farnham Caſtle, Surrey; his Lordſhip was pleaſed to requeſt that an account of it might be laid before the Linnean Society. For this purpoſe I was induced to go to Farnham in November 1799, accompanied by Mr. Sowerby, in order to make the requiſite obſervations. We found the fruit then ripe, and exhibiting a moſt magnificent ſpectacle. The plant was much larger than any I had ſeen of the ſame ſpecies, and ſeems to be one of the oldeſt in England. We learn from the *Hortus Kewenſis* that this *Cycas* has been about 40 years in our collections. It is not known that the Farnham plant was larger at its firſt introduction than ſuch as are uſually brought from abroad, perhaps 2 or 3 feet in the diameter of the circle formed by the expanded leaves; that diameter is now 10 or 12 feet. Suppoſing it therefore to have been one of the very firſt introduced, it has grown much more rapidly than uſual; for there are few to be ſeen in England, even the oldeſt, that are half ſo large. I ſhall proceed to deſcribe its appearance and ſtructure.

The ſtem is about 2 feet in height, and 9 or 10 inches in diameter. Thunberg deſcribes the ſame as riſing in Japan to the height of 6 feet or more, with nearly the abovementioned diameter. Its ſurface is brown, and very ſcaly with the remains of old leaf-ſtalks.

ſtalks. A ſimple circle of about 40 evergreen pinnate leaves crowns the ſummit, forming a magnificent baſon, whoſe margin meaſures 10 or 12 feet acroſs, and 5 or 6 feet in height above the level of the bark bed of the ſtove. On mounting a ladder we beheld in the bottom of this verdant and ſhining amphitheatre a circular cluſter, perhaps 18 inches wide, of above an hundred orange-coloured downy oval fruits, intermingled with innumerable palmate, pale brown, thick and woolly leaves or fronds, each of whoſe finger-like ſegments was tipped with a ſharp ſpine. With reſpect to its earlier ſtate, the Biſhop has informed me, that on his arrival at Farnham early in September, the gardener informed his lordſhip the *Cycas* "had borne a ſingular appearance during ſummer." On inſpection, the crown of the plant was found occupied by the abovementioned woolly leaves, then beautifully laciniated though not ſpinous, and having the appearance of a *ſtrobilus* or cone, hollow like a bird's neſt, and filled with a quantity of green *drupæ*, about the ſize of half-grown apricots, and intermixed with the ſame kind of downy greyiſh leaves that ſurrounded them. The changes which had taken place from that time to the period of my arrival were, that the whole cluſter of fronds and fruit had become rather convex than concave, the fronds were browner, ſpines had grown at the tip of each of their lengthened ſegments, and the *drupæ* were become nearly as large as a moderate ſized apricot, and further reſembled that fruit in their rich orange hue and downy ſurface.

On ſeparating ſome of theſe woolly leaves, they were found to be true fronds. Each was from 6 to 8 inches long, fleſhy, entirely clothed with pale brown woolly down; their lower part a flattiſh ſtalk; their middle bearing on each margin a row of 3 or four ſeſſile *drupæ*; their extremity dilated into a pinnatifid, or rather palmate, many-fingered leaf, whoſe lobes were generally curved inwards, and tipped with a ſpine as before mentioned. When wounded, theſe fronds

diſtilled a great quantity of thick clear inſipid mucilage, which ſoon hardened into a ſubſtance reſembling gum tragacanth, in which probably reſides the nutritive quality for which this Palm is ſo celebrated in the *Flora Japonica*. We are there told that a very ſmall morſel of the pith of its ſtem is ſufficient to ſuſtain life a long time, and on that account the plant is jealouſly preſerved for the uſe of the Japaneſe army. The *drupæ* are alſo ſaid to be uſed as food. We roaſted ſome, and found in their kernels the flavour of cheſnuts, with leſs ſweetneſs and a more watery conſiſtence. Each *drupa* is elliptical or ſomewhat obovate, a little compreſſed, tipped with a minute rigid point formed of the permanent ſtigma, which is umbilicated at its ſummit. The outer coat is coriaceous, bright orange red, clothed with woolly down which eaſily rubs off. This coat is not eatable. Nut ſolitary, elliptical, even, hard, whitiſh, tipped with a point connected with the ſtigma, and internally lined with a looſe brown membranous integument cloſely enfolding the kernel, which is alſo elliptical, white, firm, uniform, completely occupying the ſhell, and conſiſting entirely of *albumen* *. In its upper part, immediately under the ſtigma, we diſcovered a ſmall round cavity where the embryo ſhould have been, but no traces of it were to be found, for want of impregnation by the male pollen, which is produced on a ſeparate tree. Probably the flavour of the nuts might have been improved had they been impregnated.

Enough has been ſaid to ſhow the near affinity of this genus to *Zamia*, (ſee Gærtner, *tab.* 3.) from which it is chiefly, and indeed ſufficiently, diſtinguiſhed by its *drupæ* growing on a true frond, contraſted with the amentaceous fruit of *Zamia*. The two genera perhaps, conſtitute an intermediate order between *Palmæ* and *Filices*, but are ſurely moſt akin to the former.

* Gærtner rather chooſes to call it *vitellus* in *Zamia*.

The

Cycas revoluta

Lou

Linn Trans VI tab 30 p 315

Cycas revoluta

The annexed figure (TAB. XXIX.) is taken from a fine drawing by Miſs North, preſented to the Society by the Biſhop of Wincheſter. It repreſents as much of the plant as was poſſible, ſomewhat under the natural dimenſions, nor could the full number of ſurrounding leaves be conveniently admitted.

TAB. XXX. exhibits one of the fronds of its full ſize. Fig. 1. is an abortive *drupa*; 2. a ripe one; 3. a *drupa* cut longitudinally; 4. all the integuments of the fruit; 5. *albumen*; 6. cavity deſtined to contain the embryo.

XXIV. *Species of Erica.* By *Richard Anthony Salisbury, Esq. F.R.S. & L.S.*

Read October 6, 1801.

ERICAS, in absolutâ monographiâ nunc illustrare, minime mihi propositum est. Attamen, quandoquidem in hoc genere nonnihil desudaverim, et multæ ejus pulcherrimæ species, sub ineptis ne dicam falsis hortulanorum titulis, iterum a *Willdenow* evulgantur, meos Characteres, et Nomina, demum profero.

Species ordinavi secundum earum affinitates, adeo ut inter se proxime collocentur similimæ: cuivis diversæ methodo parum amicus. Etenim, si e numero foliorum separas, hunc non solum in unâ eâdemque stirpe mire ludentem offendes, sed tales divisiones magnitudine suâ laborantes fere nihil juvant: idem fortius objiciatur sectionibus ex antheris muticis calcaratisve petitis, quippe quæ valde propinquas species, imo ipsas varietates distrahunt: nec magis naturalem distributionem, vel e bracteis, vel ex inflorescentiâ, vel e filamentis, vel e fructu, adhuc extorquere potui. Jamdudum nos docuit *Linnè*, in Regno Vegetabili novæ prolis Herbam sequi patrem, Florem vero matrem: inde Clavis vastissimorum generum, ut mihi videtur, haud ita difficilis. Quamobrem cohortes e structurâ corollæ antherarumque potissimum desumpsi, gradumque affinitatis per comma, semicolon, rariusve colon, pone singula nomina appositum, indicavi: ubi nullum vidi præter communem generis nexum, ista species periodo notatur: multas enim similitudines oculis conspicimus, quas tamen verbis exprimere admodum difficile sit. Nihilominus in Differentiis Specificis, puras certissimasque notas eligere conatus sum, haud magis

magis quod opus eſſet dicere, quam quod non opus eſſet, non dicere, ſolicitus.

Mirum fortaſſe nonnullis videatur, Ericam *vulgarem* deſiderari in ſequentibus paginis: ſciant autem velim, hancce ſtirpem, ſi quæ alia in toto Ordine, proprium conſtituere genus: jure antiquiore profecto ſuum nomen retinuiſſet, ſed cum tot aliæ ſtirpes, apud omnes Botanicos jam eodem cognomine gaudeant, ſatius duxi hanc unam novo inſignire titulo: itaque *Callunam* appellavi, ob uſum ejus frequentiſſimum in ſcopis conficiendis: eſſentia generis, quâ differt ab *Ericâ*, eſt in pericarpii valvis ad latera loculorum dehiſcentibus, ſeptis axi relictis: habitus, abſque ullo rudimento petioli pedunculive, omnino ſeſſilis. Alterum genus, cum illo pariter confuſum, ob ſtigma grande *Salaxis* mihi audit, cujus calyx irregularis, et pericarpium drupaceum, triloculare, triſpermum: quatuor ſpecies innotuere, faciem Ericæ *ſcopariæ* præ ſe ferentes.

Paucas obſervatiunculas, in editione Diſſertationis Ericæ *a Thunberg*, quam nuper typis mandabam, inſerui. Hallucinationes graviores in tam vaſto genere pene inevitabiles, Synonyma infra tacite indicabunt: cæterum hæc non niſi ex ſpeciminibus ipſis auctorum unquam citavi. Maximâ profecto beneficientiâ ſua Herbaria mihi patefecerunt omnes, atque fruſtula vel rariſſimorum exemplarium communicaverunt: adeo ut ducentas et quinquaginta legitimas ſpecies nunc poſſideam, quarum dimidiam circiter partem in vivis alo. Haſce omnes, numeroſiſſimis varietatibus miſtas dignoſcere, et prout verum Botanicum decet exponere, haud labor erit paucorum annorum: nimis felix ſi qua hactenus videar veſtigiis inſtitiſſe admirandi *Linnè*, qui non abſque divino quodam afflatu, cum Vegetabilium differentias tradidit, longiſſimo intervallo omnes ſuperavit.

Synopſis

Synopſis Specierum, ſecundum earum Affinitates.

Scoparia. 3. *m. i. p*: *ax.*

Spiculifolia. 3. *m. i. ax.*

Virgularis, 3. *m. i. t.*
Aſperifolia, 3. *mc. i. t.*
Ferox. 3. *m. i. t.*

Oxycoccifolia, 3. *c. i. ax?*
Thymifolia. 3. *c. ie. ax.*

Axillaris. 3:4. *c. i. ax.*

Sicæfolia. 3. *c. i. t.*

Urceolaris, 3. *c. i. t.*
Fauſta, 3. *c. i. t.*
Pallida, 3. *c. i. t.*
Tomentoſa, 3. *c. i. t.*
Auricularis, 3. *c. i. t.*
Lamellaris, 3. *c. i. t.*
Marifolia, 3. *c. i. t.*
Helianthemifolia. 2. *c. i. t.*

Calathiflora. 3. *c. i. t.*

Procera, 3:5. *c. i. t.*
Polytrichifolia. 3:5. *c. i. t.*

Tenuis. 3. *c. i. t.*

Humilis: 3. *c. i. t.*

Peduncularis: 3. *c. i. t.*

Amœna. 3. *c. i. t.*

Glomiflora, 3. *c. i. t.*
Formoſa. 3. *c. i. t.*

Carduifolia. *c. i. t.*

Tubercularis. 3. *m. i. t.*

Campanularis. 3. *m. i. t.*

Mediolifiora. 3. *m. i. t.*

Blanda, 3. *m. i. t.*
Hottoniæflora, 5. *c. i. ax.*
Seriphiifolia, 5. *m. i. ax.*
Lavandulæfolia, 3. *m. i. t.*
Humifuſa, 3. *m. i. t.*
Criſtæflora, 3. *m. i. t.*
Lyſimachiæflora, 3. *m. i. t.*
Paſſerinæfolia: 3. *m. i. t.*

Byſſina,

Byſſina, 3. *m. ic. t.*
Velleriflora, 3. *m. e. t.*
Carbaſina: 3. *m. e. t.*

Scarioſa, 3. *c. e. t.*
Sexfaria, 3. *c. e. t.*
Corydalis, 3. *c. i. t.*
Azaleæfolia, 3. *m. e. t.*
Petiolaris, 3. *m. i. t.*
Veſicularis, 3. *c. i. t.*
Verniciflua, 3. *c. i. t.*
Lachneæfolia, 3. *c. i. t.*
Volutæflora, 3. *c: m. i. t.*
Lyrigera, 3. *c. i. t.*
Salax, 3. *c. i. t.*
Gnidiæfolia, 3. *c. i. t.*
Cumuliflora, 3. *m. i. t.*
Geniſtæfolia, 3. *m. i. t.*
Periplocæflora, 3. *c. i. t.*
Lucida, 3. *c. i. t.*
Munda, 3. *c. i. t.*
Gnaphaliiflora. 3. *c. i. t.*

Fabrilis, 3. *c. i. t.*
Dianthifolia, 2. *c. i. t.*
Brevifolia, 3. *c. i. t.*
Chlamydiflora, 3. *c. i. t.*
Selaginifolia. 3. *c. i. t.*

Pannoſa. 3 : 5. *c. i. t.*

Hirſuta, 4. *m. i. t.*
Plumoſa, 4. *c. i. t.*
Ciliciiflora. 3. *m. i. t.*
Xeranthemifolia, 3. *m. e. t.*
Nodiflora, 3. *m. e. t.*
Floſculoſa, 4. *m. e. t.*
Exilis, 4. *m. e. t.*
Labialis, 3. *m. e. t.*
Embolifera, 4. *c. e. t.*
Dumoſa, 4. *c. e. t.*
Barbigera, 4. *m. e. t.*
Paleacea, 4. *m. e. t.*
Bruniæfolia, 6. *c. e. t.*
Turmalis, 6. *m. e. t.*
Equiſetifolia. 3. *m. e. t.*

Diotæflora, 3. *m. e. p: ax.*
Sertiflora, 3. *m. e. p: ax.*

Flexilis. 4. *m. e. ax.*

Saxatilis, 3-5. *m. e. p: ax.*
Lugubris, 4. *m. e. p: ax.*
Multiflora, 5-6. *m. c. p: ax.*
Manipuliflora, 3. *m. c. p: ax.*
Vaga. 5-6. *m. c. p: ax.*

Lentiformis: 3. *m. e. t.*
Pudibunda. 3-4. *m. e. t.*

Filiformis, 3. *c. e. t.*

Turgida,

Turgida. 3. *c. e. t.*

Fuſiformis ; 3 : 4. *m. e. t.*
Fragilis ; 3. *m. e. t.*
Veſtiflua, 3. *m. e. t.*
Baculiflora, 3. *m. e. t.*
Cothurnalis, 3. *m. e. t.*
Socciflora, 3. *m. e. t.*
Furfuroſa, 3. *m. e. t.*
Follicularis, 3. *m. e. t.*
Penicilliflora. 3. *m. e. t.*

Placentæflora, 3. *m. e. t.*
Pyramidalis, 3. *m. e. t.*
Squamæflora, 3. *m. e. t.*
Cæſia, 3. *m. e. t.*
Flexuoſa, 3. *m. e. t.*
Laſciva, 3. *m. e. t.*
Styloſa, 3. *m. e. t.*
Spirææflora, 3. *m. e. t.*
Milleflora. 3. *c. e. t.*

Dioſmæfolia, 3. *c. i. t.*
Palliiflora, 3. *c. i. t.*
Fugax, 3. *c. i. t.*
Pyrolæflora, 3 : 4. *c. i. t.*
Tegulæfolia, 3. *c. i. t.*
Baccæformis. 4 : 3. *c. i. t.*

Modeſta : 3. *c. i. t.*

Holoſericea. 3. *c. i. t.*

Glauca : 3. *c. i. t.*

Variifolia. 3. *c. i. t.*

Rupeſtris. 3. *c. i. t.*

Verſicolor, 3. *m. i. t.*
Decora, 3. *c. i. t.*
Cupreſſiformis, 3. *c. i. t.*
Melliflua. 3. *c. i. t.*

Nana, 4. *c. i. t.*
Spiſſifolia, 6. *c. i. t.*
Sacciflora, 4. *c. i. t.*
Cylindriflora. 6. *c. i. t.*

Paludoſa, 6. *m. i. t.*
Lituiflora. 4. *m. i. t.*

Obpyramidalis, 4. *m. i. t.*
Cyrillæflora, 4. *m. i. t.*
Velitaris. 4. *c. i. t.*

Culcitæflora, 4. *c. i. t.*
Tubiflora, 4. *c. i. t.*
Curviflora, 4. *c. i. t.*
Cuſpidigera, 4. *c. i. t.*
Bibax, 4. *c. i. t.*
Buccinæformis, 4. *c. i. t.*

Faſtuoſa,

Faſtuoſa. 4. *c. i. t.*

Stagnalis, 4. *m. i. t.*
Conſpicua, 4-5. *m. i. t.*
Longiflora, 6. *m. i. t.*
Verticillaris, 5-6. *m. i. t.*
Floccoſa. 5-6. *m. i. t.*

Radiiflora, 8. *c. i. p: lat.*
Lycopodiifolia. 6. *m. i. p: lat.*

Pharetræformis, 6. *m. i. p: ax.*
Grandiflora, 6. *m. e. p: ax.*
Cerviciflora, 5-6. *c. e. p: ax?*
Pinifolia, 6. *c. i. p: ax.*
Calamiformis, 6. *m. i. p: ax.*
Longifolia, 6. *m: c. i. p: ax.*
Coſtæflora, 6. *m. i. p: ax.*
Onoſmæflora, 6. *m. i. p: ax.*
Pulviniformis, 6. *m. i. p: ax.*
Frondoſa, 6. *m. i. p: ax.*
Phylicæfolia, 6. *m. i. p: ax.*
Argutifolia. 6. *m. i. p: ax.*

Favoſa, 6. *c. i. p: ax.*
Sceptriformis, 8. *c. i. p: ax.*
Clavæflora, 6. *c. i. p: ax.*
Alveiflora, 6. *c. i. p: ax.*
Mammoſa, 4. *c. i. p: ax.*

Brachialis. 4. *m. i. t.*

Hyſtriciflora, 4. *m? i. t.*
Strigilifolia, 4. *c. i. t.*
Pectinifolia, 4. *c. i. t.*
Crinifolia. 6. *c. i. t.*

Cernua. 4. *c. i. t.*

Doliiformis. 6. *c. i. t.*

Piſtillaris 4. *c. i. t.*

Ciliaris: 3. *m. i. ax.*

Botuliformis, 4. *c. i. t.*
Multicaulis. 6. *c. i. t.*

Mutabilis. 3. *c. i. lat.*

Uncifolia. 4. *c. i. p: ax.*

Caduceifera. 3. *c. i. p: ax.*

Empetrifolia, 6. *c. i. p: ax.*
Malleolaris, 6. *c. i. p: ax.*
Pyxidiflora, 6. *c. i. p: ax.*
Nolæflora. 6. *c. i. p: ax.*

Feſta, 4. *c. i. p: ax.*
Fallax, 6. *c, i. p: ax.*
Parilis, 6. *c. i. p: ax.*
Viſcida. 6. *c. i. p. ax.*

Catervæflora; 4. *c. i. t.*
Pubigera, 4. *c. i. t.*
Mitræformis, 4. *c. i. t.*
Tardiflora, 4. *c. i. t.*
Parviflora, 4. *c. i. t.*
Exigua, 4. *c. i. t.*
Puſilla. 4. *c. i. t.*

Tragulifera, 4. *c. i. t.*
Guttæflora, 4. *c. i. t.*
Curviroſtris, 4. *c. i. t.*
Obeſa, 4. *c. i. t.*
Gracilis, 4. *c. i. t.*
Intervallaris, 4. *c. i. t.*
Quadræflora, 4. *c. i. t.*
Prolifera, 4. *c. i. t.*
Cyathiformis, 4. *c. i. t.*
Pelviformis. 4. *c. i. t.*

Turrigera, 4. *c. i. t.*
Lacunæflora, 3-5. *c. i. t.*
Florida. 4. *c. i. t.*

Turbiniflora, 4. *c. i. t.*
Bullularis, 3-4. *c. i. t.*
Mucoſa, 4-6. *c. i. t.*
Piluliformis, 4-5. *c. i. t.*
Obliqua, 6. *c. i. lat.*
Sequax, 4-6. *c. i. t.*
Blenna. 4-5. *c. i. t.*

Verecunda. 4. *c. i. lat.*

Glabella. 4. *c. i. t.*

Embothriifolia, 3. *c. i. lat.*
Glutinoſa, *alt. c. i. lat.*
Curvifolia: 3. *c. i. lat.*

Squarroſa, 6. *c. i. t.*
Gorteriæfolia, 4. *m. i. t.*
Ampullæformis, 4. *m. i. t.*
Capax, 4. *m. i. t.*
Lagenæformis, 3-4. *m. i. t.*
Jaſminiflora: 3-4. *m. i. t.*

Pavettæflora, 4. *c. i. t.*
Faſciformis, 4. *m. i. t.*
Fiſtulæflora, 4. *m. i. t.*
Fragrans, 4. *c: m. i. t.*
Galiiflora, 4. *c. i. t.*
Nidiflora, 4. *c. i. t.*
Denticularis, 4. *m. i. t.*
Pulchra, 4. *m. i. t.*
Daphniflora, 4. *m. i. t.*
Pellucida. 4. *m. i. t.*

Amabilis, 4. *c. i. ax.*
Venuſta; 4. *c. i. ax.*
Imbellis, 2. *c. i. ax.*
Linifolia, 2. *c. i. ax.*
Borboniæfolia, 2. *c. i. ax.*

Corifolia, 3. *c. i. ax.*
Obvallaris, 3. *c. i. ax.*
Hyſſopifolia, 3. *c. i. ax.*
Taxifolia: 3. *c. i. ax.*
Pugionifolia, 3. *c. i. p: ax.*
Viminalis. 3. *c. i. p: ax.*

Figuræ Arabicæ numerum foliorum in ſingulis verticillis indicant: Litera *c.* filamenta calcarata, *m.* mutica; *e.* antheras exſertas, *i.* incluſas; *ax.* infloreſcentiam axillarem, *p: ax.* pſeudo-axillarem, *t.* terminalem, *lat.* lateralem.

ERICA.

Character Generis.

Corolla perſiſtens. Antheræ 4—10, ante antheſin per foramina duo lateralia connexæ. Pericarpium membranaceum, 4—8-loculare: Valvæ 4—8, medio loculorum una cum ſeptis ab axi dehiſcentes. Semina 10—100 in ſingulis loculis, decidua.

Differt ab *Andromedâ*, corollâ non deciduâ, et ſtructurâ antherarum: a *Menzieſiâ*, præter eaſdem notas, necnon fructu; ad quam *Erica Daboecii* referenda.

Characteres Specierum.

E. caule pubeſcentulo: corolla $\frac{3}{4}$-lineari, lævi; tubo cyathiformi: filamentis muticis: ſtigmate peltato. *Scoparia.*

E. fucata. *Thunb. Diſſ. n.* 9. E. ſcoparia. *Linn. Mant. p.* 372. E. ſcoparia. *Linn. Diſſ. n.* 13. *cum fig. floris.* E. coris folio IIII. *Cluſ. Hiſt. Pl. lib.* 1. *p.* 42.

Cum ſuâ *Arboreâ* in Horto Cliffortiano olim confudit Linnè, neque poſtea filamenta eſſe mutica unquam animadvertit.

Spiculifolia. E. pedunculis ebracteatis: calyce breviter 4-fido: corollâ 1-lineari, lævi; tubo cyathiformi, 4-angulo: filamentis muticis.
E. olympiaca. *Sibth. MS.*
Sponte naſcentem in ſummitate Montis *Olympus*, legit heu defunctus Sibthorpe.
Perſingularis eſt defectus bractearum.

Virgularis, E. foliorum laminis plus minus ovatis: corollâ $\frac{2}{3}$—1-lineari, viſcidâ; tubo ſphærico: ſtigmate peltato.
Variat α: E. abſinthoides. *Linn. Mant. p.* 66.
β: E. virgata β. *Thunb. Diſſ. n.* 18.
γ: E. virgata γ. *Thunb. Diſſ. n.* 18.
δ: E. hiſpidula. *Linn. Suppl. p.* 222.
ϵ: E. hiſpida. *Thunb. Diſſ. n.* 20.
Ab hiſce omnibus longe diſcrepat E. virgata δ. *Thunb.* quæ, ni fallor, *Salaxis* eſt.

Aſperifolia, E. foliorum laminis linearibus: corollâ $1\frac{1}{4}$-lineari, viſcidâ; tubo ſphærico: filamentis ſæpius calcaratis: pericarpio lanato.
E. ſetacea. *Andr. Er. n.* 62. *cum Ic.* bonâ.
Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Ferox. E. calcyce ſerrato: corollâ $1\frac{1}{2}$-lineari, lævi; tubo ventricoſo, dein iterum dilatato: pericarpio glabro.
E. totta. *Thunb. Diſſ. n.* 17.
Sponte naſcentem in *Konde Bockveldt*, legit F. Maſſon.
Bracteæ 3 juxta calycem.

Oxycoccifolia, E. caule decumbente, filiformi: foliorum laminis ovatis:

ovatis: corollâ 1½-lineari, campanulatâ, hirſutâ: filamentis muticis.

Sponte naſcentem in *Hottentots Holland*, ſolo humido, legit I. Mulder.

Pulchella ſpecies: utinam ad vivam accuratius deſcribere mihi quandoque liceat: tum caulis, tum folia Oxycoccum *Paluſtrem* ad amuſſim ſimulant.

E. caule diffuſo: foliorum laminis ovatis: corollâ 1—1½-lineari: filamentis baſi valde dilatatis: pericarpio hirſuto. *Thymifolia.*

Variat α: Corolla 1-linearis, viſcido-pubeſcens. Antheræ incluſæ.

E. planifolia. *Thunb. Diſſ. n.* 60. E. planifolia. *Berg. Pl. Cap. p.* 10. E. planifolia. *Linn. Sp. Pl. ed.* 2. *p.* 508.

β: Corolla 1½-linearis, minutiſſime viſcido-pubeſcens. Antheræ exſertæ.

E. planifolia. *Willd. Sp. Pl. v.* 2. *p.* 362. E. africana hirſuta, &c. *Plukn. Mant. p.* 69. *t ab.* 347. *pl.* 1.

γ: Corolla 1½-linearis, lævis. Antheræ exſertæ.

E. thymifolia. *Wendl. Obſ. p.* 48.

Margo foliorum in omnibus conſtanter recurvulus.

E. foliorum laminis ſetuloſis: bracteis 2, minutis: corollâ 1½-lineari, lævi: calcaribus ſubulatis, hirtis. *Axillaris.*

E. ſtrigoſa. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 17. E. arborea. *Thunb. Diſſ. n.* 63.

Sponte naſcentem in *Taffelberg*, legit F. Maſſon.

Variat floribus albis purpureiſque.

E. foliorum

Sicæfolia. E. foliorum laminis mucronatis: corollâ $1\frac{1}{2}$-lineari, extus hirſutâ; tubo cyathiformi: calcaribus linear-attenuatis: pericarpio glabro.
Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.
Nulli mihi cognitæ affinis eſt.

Urceolaris, E. foliorum laminis ſetoſis: corollâ 3-lineari, extus pubeſcente; tubo urceolari: calcaribus linear-attenuatis.
E. dura. *Soland. MS.* E. hirta. *Thunb. Diſſ. n.* 56.
Flores pallide purpurei.

Fauſta, E. foliorum laminis ſetoſis: corollâ $2\frac{1}{2}$-lineari, extus pubeſcente; tubo urceolari: calcaribus aurito-attenuatis, valde ſerratis.
Sponte naſcentem in *Hottentots Holland*, ſolo humido, legit I. Mulder.
Valde ſimilis antecedenti: ſed Foliorum laminæ baſi latiores; Pubeſcentia alia; et Antheræ omnino diverſæ, in hac lineares ſeu totæ æqualis latitudinis, in illâ verſus apicem ſenſim anguſtatæ.

Pallida, E. foliorum laminis linearibus: calyce lateribus reduplicato: corollâ 2-lineari, utrinque pubeſcente: calcaribus brevibus.
E. pubeſcens piloſa. *Thunb. Diſſ. n.* 61. E. pubeſcens. *Linn. Sp. Pl. ed.* 2. *p.* 506. auctoritate ſpeciminis in ejus herbario a *Burman.*
Variat magnitudine et pubeſcentiâ foliorum; ſed, ni fallor, conſtanter 3-na ſunt.

E. foliorum

E. foliorum laminis anguſte linearibus: calyce planiuſculo: corollâ $1\frac{1}{2}$-lineari, utrinque tomentoſâ: calcaribus longis, recurvis. *Tomentoſa,*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Bracteæ juxta baſin pedunculi ſitæ, cum quo et calyce corollæ concolores.

E. foliorum laminis lineari-lanceolatis: corollâ 2-lineari, extus pubeſcente; tubo ovato: calcaribus minutis, auricularibus. *Auricularis,*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Herba ſequentis: cæterum ab omnibus hujus cohortis, calcaribus minutis fere ut in *Galiiflorâ*, diverſa.

E. foliorum laminis lineari-lanceolatis: corollâ 3-lineari, tubo pyramidali, extus pubeſcente: calcaribus glabris. *Lamellaris,*

E. urceolaris. *Pl. Kew. t.* 16. E. urceolaris. *Berg. Pl. Cap. p.* 107. E. pentaphylla. *Linn. Sp. Pl. ed.* 2. *p.* 506. E. caffra. *Linn. Sp. Pl. ed.* 1. *et* 2. auctoritate ſpeciminis Cliffortiani.

Nulla pars in hac ſpecie urceolaris eſt: a foliis longis planiuſculis, titulum ſaltem non falſum offero.

E. foliorum laminis late ovatis, planiuſculis: corollâ $1\frac{2}{3}$-lineari, utrinque pubeſcente; tubo ovato: calcaribus pubeſcentibus. *Marifolia,*

E. marifolia.

E. marifolia. *Andr. Er. n.* 29. *cum Ic.* E. marifolia. *Pl. Kew. t.* 14. optima. E. marifolia. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 15.

Sponte naſcentem juxta *Conſtantia* abunde, legit F. Maſſon.

Helianthemifolia. E. foliis 2-nis; laminis obovatis planiuſculis: corollâ 2-lineari, utrinque pubeſcente: calcaribus longis.

E Promontorio *Cap.*

Communicavit primum cum viginti aliis ſpeciebus *Georgius Hibbert*, ob raras difficillimaſque ſtirpes quas introduxit, merito celebris.

Calathiflora. E. calyce tomentoſo: corollâ 1-lineari, lævi: calcaribus cuneatis, hirtis: pericarpio tomentoſo: ſtigmate longe exſerto.

E. bicolor. *Thunb. Diſſ. n.* 57.

Procera. E. caule tomentoſo: bracteis approximatis: calyce baſi medioliformi: corollâ 1—2-lineari: ſtigmate peltato.

E. ſcoparia. *Thunb. Diſſ. n.* 80. E. arborea. *Linn. Diſſ. n.* 14. *cum fig. floris.* E. caffra. *Linn. Diſſ. n.* 22. *cum fig. floris.* auctoritate ſpeciminum ad quæ ibi deſcripſit. E. triflora. *Berg. Pl. Cap. p.* 118. E. arborea. *Linn. Sp. Pl. ed.* 2. *p.* 502. E. ſcoparia. *Linn. Sp. Pl. ed.* 1. *p.* 353, excluſis ſynonymis. E. coris folio 1. *Cluſ. Hiſt. Pl. lib.* 1. *p.* 41.

Sponte naſcentem juxta *Baia*, legit amiciſſimus Smith.

Variat admodum in diverſis regionibus, ſtigmate etiam incluſo.

E. caule

E. caule tomentoso: bracteis remotis: calyce basi sensim angustato: corollâ 1½—2-lineari: calcaribus cuneatis. *Polytrichifolia.*

Sponte nascentem prope *Lisboa*, legit Banks.

Prioris nonnullis varietatibus similis, sed hæc mihi videtur legitima species. Foliorum laminæ angustiores, magis attenuatæ. Flores in nostrâ stirpe cultâ plane inodori. Corolla oblonga: tubo poculiformi. Stigma fibulæ-forme, nec late peltatum. Pericarpium pyriforme.

E. caule divaricato: foliorum laminis linearibus: corollâ ¾-lineari, campanulatâ, lævi: filamentis brevissimis: calcaribus lineari-attenuatis. *Tenuis.*

E. divaricata. *Hortulanis.*

E. caule glabro: foliorum laminis argute reduplicatis: corollâ 2½-lineari: calcaribus longis, subulatis, hirtis. *Humilis.*

E. depressa. *Thunb. Diss. n.* 50. *cum Ic.*

E. foliorum laminis linearibus: corollâ 3-lineari: tubo globoso: antheris longissime foraminosis, lanatis. *Peduncularis.*

E. rubens. *Thunb. Diss. n.* 83.

Sponte nascentem in *Koude Bockveldt*, montibus, legit F. Masson.

Pedunculi pollicem longi sunt.

E. foliorum laminis lanceolatis: corollâ 4—5-lineari; tubo urceolari; limbo brevissimo: antheris breviter foraminosis, glabris. *Amœna.*

E. incarnata. *Thunb. Diſſ. n.* 84.
Toto cœlo diverſa ab E. *incarnatâ* hortulanorum, et non niſi ex ſpecimine *Thunbergiano* mihi cognita.

Glomiflora, E. foliorum laminis anguſte cuneatis: calyce bracteis imbricato: corollâ $2\frac{1}{2}$-lineari, viſcidâ; tubo ſphærico: calcaribus villoſiſſimis.
E. veſicaria. *Soland. MS.*
Sponte naſcentem in *Hottentots Holland,* legit F. Maſſon.

Formoſa. E. calyce incurvo-deflexo: corollâ $1\frac{1}{4}$-lineari, viſcidâ; tubo ſphærico, 8-angulo: antheris baſi valde arcuatis: ſtigmate lato.
E. formoſa. *Thunb. Diſſ. n.* 82. *cum Ic.*
Sponte naſcentem in *Lange Kloof,* regionibus orientalibus, legit F. Maſſon.

Carduifolia. E. foliorum laminis ſetoſis: pedunculis longis: corollâ $2\frac{1}{2}$-lineari, lævi; tubo globoſo: filamentis breviſſimis.
Communicavit *Hibbert.*
Inflorescentia adhuc mihi dubia: forte in rudimentis ramulorum terminalis. Stigma anguſtum.

Tuberſularis. E. corollâ $1\frac{1}{3}$-lineari, tuberculis aſperâ; tubo globoſo: filamentis muticis: pericarpio longe ſtipitato.
E. inclyta. *Soland. MS.*
Antheræ minutæ, totæ læves.

Campanularis. E. caule glabro: foliorum laminis anguſtis: corollâ $2\frac{1}{2}$-lineari,

2½-lineari, campanulatâ, lævi: filamentis breviſſimis, muticis.

E. tenuifolia. *Hortulanis.*

Sponte naſcentem in *Hottentots Holland*, locis humidis, legit F. Maſſon.

Flos Convallariæ majalis *Linn.* ſed luteus.

E. calyce tetraphyllo: corollâ 4-lineari, lævi; tubo medioliformi; limbo baſi integro: antheris papuloſis. *Medioliflora.*

E. Thunbergii. *Linn. Suppl. p.* 220.

Genus jam tanto nomini ſacratur, nec cum ſpecificis, hujuſmodi titulos miſcendos eſſe cenſeo.

E. floribus glomeratis; corollâ 1½-lineari; limbo tubo ½ longiore, laciniis ſemiorbicularibus: ſtigmate lato. *Blanda,*

E. cornuta. *Roxb. MS.*

In hac pulcherrimâ cohorte, Antheræ ipſæ ultra foramen in criſtam plus minus producuntur.

E. calycis foliolis ſerrulatis: corollâ 2½-lineari; limbo baſi integro, emarginulato: filamentis calcaratis. *Hottoniæflora,*

E. cubica. *Andr. Er. n.* 39. *cum Ic.* malâ. E. cubica. *Linn. Mant. p.* 233.

E. calycis foliolis minute ciliatis: corollâ 1½-lineari; limbo baſi integro, obtuſo: filamentis muticis. *Seriphiifolia,*

E. cubica. *Thunb. Diſſ. n.* 46.

Sponte naſcentem in *Hottentots Holland*, montibus, legit I. Mulder.

Nullam *cubicam* partem in his duabus ſpeciebus unquam detegere potui: præter notas autem ſupra

memoratas, discrepant Proportione, situ Bracteearum, et colore Antherarum. Flores in utraque axillares.

Lavandulæfolia, E. caule incano: bracteis juxta calycem: corollâ 2-lineari; tubo 4-angulo; limbo incurvo: filamentis inferne latissimis.
Sponte nascentem in *Hottentots Holland,* legit F. Masson.

Humifusa, E. foliis 2-nis; laminis ovalibus; corollâ $1\frac{1}{2}$-lineari, limbo amplo: stylo longe exserto.
E. humifusa. *Hibbert MS.*
Sponte nascentem in *Hottentots Holland,* legit I. Mulder.
Herba tota glabra videtur.

Cristæflora, E. calyce tetraphyllo: corollâ 2-lineari; limbo tubo triplo longiore, basi integro: pericarpio lævi.
E. melanthera. *Thunb. Diss. n.* 12.
Sponte nascentem prope *Constantia,* legit I. Mulder.

Lysimachiæflora, E. calyce quadrifido: corollâ 2-lineari; limbo tubo duplo longiore, basi integro: pericarpio sericeo.
E. melanthera. *Linn. Mant. p.* 232.
Stigma in hac longe exsertum.

Passerinæfolia: E. bracteis minutis: calyce breviter quadrifido, dense tomentoso: corollâ $2\frac{1}{2}$-lineari: pericarpio tomentoso.
E. passerinæ. *Linn. Suppl. p.* 221. E. Cap. Coridis fol.

fol. fl. rubello. *Pet. Gaz. t.* 3. *f.* 7. *Cat. Top. n.* 469.
Folia in noſtris exemplaribus terna.

E. calyce denſe ſericeo, bracteis imbricato, quadrifido: corollâ 2-lineari, calyce parum longiore: nectario cotyliformi, rare hirto. *Byſſina,*
E. capitata. *Andr. Er. n.* 38. *cum Ic.* E. capitata. *Linn. Mant. p.* 373. E. capitata. *Linn. Diſſ. n.* 36. *cum fig. floris.* E. capitata. *Berg. Pl. Cap. p.* 94.
E. africana calyce lanuginoſo &c. *Seb. Theſ. v.* 1. *p.* 30. *t.* 20. *f.* 1.
Flores pallide lutei: antheris ſæpius incluſis.

E. calyce denſe ſericeo, bracteis remoto, quadrifido: corollâ $1\frac{3}{4}$-lineari, calyce parum longiore: nectario cotyliformi, glabro. *Velleriflora.*
E. bruniades. *Andr. Er. n.* 61. *cum Ic.* E. capitata. *Thunb. Diſſ. n.* 15. auctoritate ejus ſpeciminis. Eriocephalos Bruniades æthiopica, Corios, &c. *Plukn. Mant. p.* 69. *t.* 347. *f.* 9. auctoritate ejus ſpeciminis.
Sponte naſcentem in *Drakenſtein,* locis humidis, legit F. Maſſon.
Flores pallide purpurei.

E. calyce denſe ſericeo, bracteis remoto, tetraphyllo: corollâ $1\frac{3}{4}$-lineari, calyce multo longiore: nectario aſtragaliformi, ſericeo. *Carbaſina.*
E. bruniades. *Linn. Mant. p.* 378. E. bruniades. *Linn. Diſſ. n.* 52. *cum fig. floris.*
Flores albidi, pallide roſei, vel etiam lutei: dignoſcas autem.

autem a *Byſſinâ*, bracteis calyce remotis; a *Velleriflorâ*, foliis latioribus et magis tomentoſis.

Scarioſa, E. bracteis ſuborbiculatis: corollâ 1½-lineari; limbo longitudine tubi; laciniis ſemilanceolatis: ſtigmate anguſto.

E. ſcarioſa. *Berg. Pl. Cap. p.* 102. E. ſpumoſa. *Berg. Pl. Cap. p.* 103. auctoritate ſpeciminum, quæ amiciſſimo *Swartz* debeo. E. ſpumoſa. *Linn. Sp. Pl. ed.* 2. *p.* 508.

Nullam differentiam extricare potui in ſpeciminibus Bergianis: hoc modo ante plenam explicationem florum, illud diu poſt, decerptum fuiſſe videtur. Filamenta rite calcarata ſunt. Antheræ in herbariis cito caducæ.

Sexfaria, E. foliis glabris; corollâ 1½-lineari, calyce obtectâ: calcaribus longis, marginalibus: pericarpio lævi.

E. ſexfaria. *Pl. Kew. f.* 11. E. ſpumoſa. *Thunb. Diſſ. n.* 14.

Antheræ hujus quoque poſt exſiccationem mox cadunt, proculdubio exſertæ.

Corydalis, E. foliorum laminis lanceolato-cuneatis: corollâ 2-lineari, limbo baſi integro: antheris dorſo alatis.

Communicavit *Hibbert.*

Nomen ab antheris galeam aliquatenus referentibus.

Azaleæfolia, E. foliorum laminis lanceolatis: corollâ 1½-lineari, hirtâ: antheris exſertis, pene totis foraminoſis.

E. ſpumoſa. *Roxb. MS.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Petiolaris, E. petiolis longis, cuneatis, fimbriatis: corollâ 2½-lineari, apice pubeſcentulâ: pericarpio rare hirto.

E. petiolata.

E. petiolata. *Thunb. Diſſ. n.* 7. *cum Ic.* bonâ.
Facies Roſmarini Officinalis, *Linn.*

E. foliis veſiculis nigris aſperſis: corollâ 1-lineari, viſcido-pubeſcente: calcaribus parallelis, cuneatis: pericarpio ſericeo. *Veſicularis,*
E. conacea. *Hortulanis.*
Sponte naſcentem prope *Stellenboſch* inter montes, legit I. Mulder.
Frutex 3-pedalis; ramis erectis, valde faſtigiatis.

E. foliis viſcidis: corollâ $2\frac{1}{3}$-lineari, limbo recurvo: calcaribus aurito-cuneatis, hirtis: pericarpio lævi. *Verniciſtua,*
E. glutinoſa. *Roxb. MS.*
Foliorum laminæ obtuſe acuminulatæ, reduplicaturâ denſe glanduloſæ, unde nitent glutine effuſo.

E. foliorum laminis ovalibus, pubeſcentibus: corollâ 2-lineari, limbo recurvo: calcaribus longis, anguſte cuneatis. *Lachneæfolia,*
E. lachnæa. *Hortulanis.*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.
Differt ab antecedente foliorum laminis penitus obtuſis, nec viſcidis: calcaribus lævibus.

E. foliis lucidis: calycis lateribus inferne recurvis: corollâ $1\frac{2}{3}$-lineari; limbo revoluto: filamentis ſæpe muticis: pericarpio tomentoſo. *Volutæflora,*
E. nigrita. *Thunb. Diſſ. n.* 53. E. nigrita. *Linn. Diſſ. n.* 11. *cum fig. floris,* peſſimâ. E. nigrita. *Linn. Mant. p.* 65. E. laricina. *Berg. Pl. Cap. p.* 94. E. africana, &c. *Seb. Theſ. v.* 2. *p.* 11. *t.* 9. *f.* 7.

Calcaria

Calcaria brevia, parallela, cuneata, interdum omnino deficiunt.

Lyrigera, E. foliis lucidis: corollâ $1\frac{2}{3}$-lineari; limbo recurvo: calcaribus ſerratis: antheris lyræformibus, hirtis: pericarpio tomentoſo.
E. nigrita. *Roxb. MS.*
Hujuſce ſpeciei diagnoſis pulcherrima, antheris ante antheſin tot lyras referentibus.

Salax, E. foliis lucidis; calyce adpreſſo: corollâ $1\frac{2}{3}$ lineari: filamentis breviſſimis: pericarpio lævi: ſtigmate lato.
E. ramoſiſſima. *Roxb. MS.*
Sponte naſcentem in *Hottentots Holland,* montibus, legit F. Maſſon.
Facies *Volutæfloræ,* ſed præter differentias ſupra datas, corollæ laciniæ in hac, ni fallor, baſi diſtinctæ.

Gnidiæfolia, E. foliorum laminis lineari-lanceolatis, pubeſcentulis: calyce late obcuneato: corollâ 2-lineari: calcaribus auricularibus.
E. veſpertina. *Linn. Suppl. p.* 221. E. calycina. *Thunb. Diſſ. n.* 78. E. calycina. *Linn. Sp. Pl. ed.* 2. *p.* 507.

Cumuliflora, E. faſciculis 7—12-floris: calyce incano: corollâ $2\frac{1}{4}$-lineari; limbo inferne ciliato: pericarpio hirto: ſtigmate anguſto.
E. aggregata. *Roxb. MS.*
Sponte naſcentem in *Hottentots Holland,* legit I. Mulder.

E. faſciculis

E. faſciculis 3-floris: calyce viſcido: corollâ 2-lineari; limbo inferne ciliato: pericarpio lævi: ſtigmate lato. *Geniſtæfolia,*

E. tetraloba. *Roxb. MS.*

Species ab antecedente penitus diſtincta; huic ſemina lævia, minute alveolata; illi lucida, æquata.

E. foliorum laminis lanceolato-cuneatis: pedunculis longis: calyce brevi, orbiculari: corollâ 1½—2-lineari: ſtigmate anguſto. *Periplocæflora,*

Communicavit *Hibbert.*

Flores in ſiccis ſaturate purpurei. Filamenta ſæpius calcaribus brevibus cuneatis armata, interdum vero prorſus mutica.

E. calyce minute ciliato, lucido: corollâ 1-lineari: calcaribus auricularibus, inciſo-ſerratis: ſtigmate anguſto, incluſo. *Lucida,*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

E. bracteis calyceque integerrimis: corollâ 1-lineari: calcaribus auricularibus, ciliatis: pericarpio hirſuto. *Munda,*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Specimen noſtrum imperfectum eſt, ante explicationem florum lectum.

E. calyce patente, margine exquiſite glanduloſo: corollâ 1-lineari, calyce vix longiore: pericarpio lævi: ſtigmate grandi 4-fido. *Gnaphaliiflora,*

E. gnaphalodes. *Thunb. Diſſ. n.* 75. E. gnaphalodes. *Linn. Diſſ. n.* 25. *cum fig. floris*, peſſimâ. E. gnaphalodes. *Berg. Pl. Cap. p.* 119.

Fabrilis; E. foliis denſe imbricatis: corollâ 1-lineari, calyce vix longiore: calcaribus integerrimis: antheris minutis, pene didymis.
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.
Herba recta, quaſi Fabri manu artificioſe impoſita.

Dianthifolia; E. foliis 2-nis, longis: calyce ovato-cuneato: corollâ 3-lineari: calcaribus ſerratis: pericarpio glabro.
Communicavit *Hibbert.*
Flores pallidiſſime purpurei.

Breviſolia, E. foliorum laminis ovatis: corollâ $1\frac{2}{3}$-lineari, calyce $\frac{1}{2}$ longiore: calcaribus lineari-attenuatis: ſeminibus ſtriatis.
E. brevifolia. *Soland. MS.*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Chlamydiflora, E. foliorum laminis linearibus, hirſutis; corollâ 2-lineari, calyce vix longiore: calcaribus auricularibus: ſeminibus æquatis.
E. viſcaria. *Roxb. MS.*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.
Calycis foliola fere diſtincta, erecto-recurva.

Sclaginifolia. E. caule tomentoſo: corollâ $1\frac{2}{3}$-lineari, lævi: tubo globoſo: calcaribus latiſſimis, orbicularibus.
Sponte naſcentem in *Lange Kloof*, legit G. Paterſon.
Omnium ſpecierum, quas detexerunt *Roxburgh*, *Paterſon*, *Maſſon*, largo ſuo more copiam mihi fecit, ſummum noſtræ ætatis decus, *Banks.*

E. foliorum

E. foliorum laminis parum reduplicatis: corollâ 2-linearî, lanatâ: filamentis latis, breviter calcaratis: ſtylo exſerto. *Pannoſa.*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Affinitatem neſcio: confer cum *Byſſinâ*, ſed folia videntur 4-na et antheræ diverſiſſimæ.

E. bracteis calyceque piloſiſſimis: corollâ 2-lineari, hirtâ, 4—5-andrâ: filamentis apice latiſſimis, muticis. *Hirſuta*,

E. hirſuta. *Thunb. Prodr. p.* 72.

E. foliis 4-nis, minutis: calyce piloſiſſimo: corollâ $1\frac{1}{3}$-lineari, hirtâ, 4—5-andrâ: filamentis calcaratis. *Plumoſa*,

E. plumoſa. *Thunb. Prodr. p.* 73. Blæria ciliaris. *Linn. Suppl. p.* 122.

Nomen peſſimum eſt, verum ex fruſtulo noſtro aliud aptum excogitare nequeo.

E. foliis 3-nis, minutis: calyce piloſiſſimo, bracteis diſtincto: corollâ $1\frac{1}{2}$-lineari, hirtâ, 4-andrâ: filamentis muticis. *Ciliciiflora*,

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Antheræ pene didymæ, valde barbatæ.

E. foliis 3-nis: laminis valde incurvis: calyce lanato, imbricato: corollâ $1\frac{3}{4}$-lineari, lanatâ, 4-andrâ. *Xeranthemifolia*,

Sponte naſcentem in *Hottentots Holland*, ſolo arido, legit F. Maſſon.

Facies diverſiſſimi generis.

Nodiflora, E. foliis 3-nis: calyce infundibuliformi, villoſiſſimo: corollâ 1½-lineari, hirtâ, 4-andrâ: antheris breviter foraminoſis.
Communicavit *Hibbert.*
Folia villoſa, nec lanata.

Floſculoſa, E. calyce fimbriato: corollâ ¼-lineari; tubo anguſtiſſimo, ſuperne repente dilatato; 4-andrâ: filamentis anguſtiſſimis.
Sponte naſcentem in *Hottentots Holland,* legit F. Maſſon.
Corolla refert floſculum diſci in Ordine Naturali Compoſitarum.

Exilis, E. foliis 4-nis: calyce infundibuliformi, glabro: corollâ ¼-lineari, glabrâ, 4-andrâ: filamentis muticis.
E. ſcabra. *Thunb. Prodr. p.* 72.
Infloreſcentiam non rite intelligo, ſpecimen enim unicum dilacerare nolui: videtur axillaris bracteis duabus in pedunculo breviſſimo.

Labialis, E. foliis 3-nis; laminis glabris: calyce 2-labiato, fimbriato: corollâ 1½-lineari, 2-labiatâ, 4—5-andrâ.
Blæria labiata. *Soland. MS.*
Sponte naſcentem in *Hottentots Holland,* legit F. Maſſon.

Embolifera, E. bracteis ſolitariis: calyce infundibuliformi, quadrangulo: corollâ 2-lineari, 4-andrâ: calcaribus recte deflexis.
E. glabella. *Thunb. Prodr. p.* 73. Blæria puſilla. *Linn. Mant. p.* 39. auctoritate ejus ſpeciminis. Blæria purpurea. *Berg. Pl. Cap. p.* 34.

Folia,

Folia, in numeroſiſſimis quæ vidi, tam cultis, quam indigenis exemplaribus, ſunt hirſuta. Inflorescentia, ut in aliis hujuſce cohortis eſt ſpica faſciculum mentiens, pedunculis breviſſimis verticillatis, bracteâ loco folii ſingulis ſubjectâ.

E. foliorum laminis fimbriatis, ſubtus glabris: corollâ $1\frac{1}{3}$-lineari, 4—5-andrâ: calcaribus recte exſtantibus. *Dumoſa,*
E. Blæria. *Thunb. Prodr. p.* 72. Blæria ericoides. *Linn. Sp. Pl. ed.* 2. *p.* 162.

E. calyce bracteis imbricato, profunde 4-fido, barbato: corollâ 2-lineari, glabrâ, 4—5-andrâ: filamentis muticis: ſtylo anguſtiſſimo. *Barbigera,*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

E. bracteis ſolitariis: calyce infundibuliformi, toto hirſuto: corollâ $1\frac{1}{2}$-lineari, 4—5-andrâ: filamentis muticis. *Paleacea,*
E. articulata. *Thunb. Prodr. p.* 71. Blæria articulata. *Linn. Mant. p.* 198.
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.
Herba valde ludit; foliorum verticillis nunc diſtinctis quaſi caulis articulatus eſſet, nunc approximatis; laminis nunc brevibus, nunc longis et linearibus.

E. foliis longis: bracteis juxta calycem, exteriore longiſſimâ: corollâ $1\frac{1}{2}$-lineari, 6-andrâ: filamentis calcaratis. *Bruniæfolia,*
E. hemiſphærica. *Soland. MS.*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

E. pedunculis

Turmalis, E. pedunculis breviſſimis: calyce minuto, adpreſſo: corollâ 2-lineari, 4—5-andrâ: filamentis muticis: antheris latis.

Sponte naſcentem in *Hottentots Holland*, legit L. Mulder.

Facies antecedentis, ſed penitus diſtincta, calyce triplo minore.

Equiſetifolia, E. foliis 3-nis: faſciculis 3—5-floris: pedunculis longis, glabris: corollâ $1\frac{1}{2}$-lineari, 4—5-andra: filamentis muticis.

E. articularis. *Hortulanis.*

Herba ut in *Imbelli*, ſed etiam gracilior.

Sertiflora, E. calyce anguſte cuneato: corollâ $1\frac{1}{3}$-lineari; tubo urceolari: antheris totis exſertis: pericarpio lævi.

E. nudiflora. *Smith Pl. Ic. ined. n.* 57 ! E. nudiflora. *Linn. Mant. p.* 229.

Sponte naſcentem in *Taffelberg*, legit G. Paterſon.

Bracteæ, minutæ quidem, pro certo adſunt in exemplare Linnæano!

Diotæflora. E. calyce late cuneato: corollâ $1\frac{1}{2}$-lineari; tubo amphoræformi: antheris parum exſertis: pericarpio pubeſcente.

E. piſtillaris. *Soland. MS.*

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Flores in rudimentis ramulorum axillaribus.

Flexilis. E. pedunculis viſcidis, axillaribus: corollâ $1\frac{1}{2}$-lineari; tubo ovato: filamentis muticis: pericarpio lanato.

E. racemoſa.

E. racemoſa. *Thunb. Diſſ. n.* 47. *cum Ic.*
Infloreſcentia in axillis ſimplex, nec racemoſa.

E. foliorum laminis argute reduplicatis : corollâ 2½-lineari ; tubo pyramidali : antheris a medio foraminoſis. *Saxatilis,*

E. carnea. *Curt. Bot. Mag. n.* 11. *cum Ic.* mediocri. E. carnea. *Jacq. Fl. Auſtr. v.* 1. *p.* 21. *f.* 31. E. carnea. *Scop. Fl. Carn. ed.* 2. *v.* 1. *p.* 275. E. purpuraſcens. *Linn. Diſſ. n.* 55. E. herbacea. *Linn. Diſſ. n.* 57. *cum fig. floris.* E. foliis, &c. *Hall. Hiſt. Helv. n.* 1013. E. herbacea. *Linn. Sp. Pl. ed.* 2. *p.* 501. E. carnea. *Linn. Sp. Pl. ed.* 2. *p.* 504. E. purpuraſcens. *Linn. Sp. Pl. ed.* 2. *p.* 503. excluſis omnibus ſynonymis præter ſequens. E. procumbens foliis in ſummitate, &c. *Seg. Ver. v.* 2. *p.* 280. auctoritate ſpeciminis a *Fabroni,* cui folia 5-na. E. procumbens, ternis foliis, carnea. *C. Bauh. Pin. p.* 486. E. procumbens herbacea. *C. Bauh. Pin. p.* 486. E. coris folio vii. viii. ix. *Cluſ. Hiſt. Pl. lib.* 1. *p.* 46.
Foliorum numerus certe ludit, adeo ut non amplius dubitaverim omnia ſupra citare ſynonyma.

E. foliorum laminis anguſte cuneatis ; floribus ſecundis ; corollâ 1½—2-lineari ; tubo urceolari : antheris ab infra medium foraminoſis. *Lugubris,*

E. mediterranea. *Curt. Bot. Mag. n.* 471. *cum Ic.* E. mediterranea. *Linn. Mant. p.* 229. E. mediterranea. *Linn. Diſſ. n.* 59. *cum fig. floris.* E. major florib. &c. *C. Bauh. Pin. p.* 485. E. coris folio 111. *Cluſ. Hiſt. Pl. lib.* 1. *p.* 42.
A ſaturo colore foliorum jamdudum diſtinxit *Cluſius.*

E. fol'orum

Multiflora, E. foliorum laminis linearibus: corollâ 1¼—2-lineari; tubo urceolari: antheris juxta apicem foraminosis.

E. multiflora. *Linn. Diss. n.* 58. *cum fig. floris.* E. multiflora. *Linn. Sp. Pl. ed.* 1. *p.* 355. E. juniperifolia, &c. *Garid. Pl. Aix. p.* 160. *t.* 32. E. foliis corios multiflora. *I. Bauh. Hist. Pl. lib.* 10. *p.* 356. E. coris folio altera. 2. quæ Narb. &c. *Clus. Hist. Pl. lib.* 1. *p.* 42. E. juniperifol. &c. *Lob. Obs. p.* 620.

Flores quoquoversi, pedunculis longiusculis.

Manipuliflora, E. caule incano: floribus in axillis interruptis: corollâ 1½-lineari; tubo cyathiformi: antheris in sertum erectis.

E. verticillata. *Forsk. Fl. p.* 210.

Juxta *Bujuchtar* a se lectam misit amicissimus Sibthorpe.

Vaga. E. caule glabro: floribus in axillis contiguis: corollâ 1⅓-lineari; tubo cyathiformi: antheris in sertum erectis.

E. vagans. *Smith in Engl. Bot. n.* 3. *cum Ic.* E. multiflora. *Bulliard Fl. Par. t.* 203. E didyma. *Stokes in With. Arr. ed.* 2. *p.* 400. E. purpurascens. *Lamarck in Encycl. Bot. v.* 1. *p.* 488. E. vagans. *Linn. Mant. p.* 230. E. vagans. *Linn. Diss. n.* 56. *cum fig. floris.* E. foliis corios multiflora. *Ray Syn. ed.* 3. *p.* 471. E. procumbens dilute purpurea. *C. Bauh. Pin. p.* 486.

Antheræ non revera didymæ.

Lentiformis. E. bracteis calyci adpressis: corollâ 1½-lineari; tubo lentiformi, basi 8-angulo: antheris juxta apicem foraminosis.

E. umbellata.

E. umbellata. *Pl. Kew. t.* 5. E. umbellata. *Linn. Sp. Pl. ed.* 2. *p.* 501. E. umbellata. *Loefl. Ref. p.* 138. E. coris folio v. *Cluſ. Hiſt. Pl. lib.* 1. *p.* 43.
Flores ramis ultra folia productis terminales, nec umbellati.

E. foliis 3—4-nis: corollâ 2-lineari, viſcidâ; tubo ovato: antheris latis, exſertis, hirtis: pericarpio turbinato, hirto. *Pudibunda.*
E. nutans. *Wendl. Er. faſc.* 3. *p.* 5. *cum Ic.*
Hanc unice omnium quas propoſui Ericarum, non vidi: icones autem a *Wendland*, ſi rudes, fideliſſimæ.

E. bracteis juxta calycem: corollâ 1-lineari, glabrâ; limbo recurvo: antheris longe foraminoſis: ſtigmate anguſto. *Filiformis*;
Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.
Caulis tenuis, diffuſus. Folia 3-na, verticillis remotis: Laminæ anguſtæ, recurvæ, viſcido-pubeſcentes. Flores terminales. Filamenta ad apicem lata. Pericarpium læve.

E. pedunculis breviſſimis: corollâ 1½-lineari, hirtâ; tubo modiali: calcaribus cuneatis: antheris breviſſimis. *Turgida.*
E. fuſco-rubens. *Roxb. MS.*

E. calyce bracteis remoto, cuneato, longitudine mire vario: corollâ 4—7-lineari, lævi; tubo ovato-pyramidali. *Fuſiformis*;

Variat α: Calyx 1½-linearis. Corolla punicea, 6—7-linearis.
E. Pluknetii. *Linn. Sp. Pl. ed.* 1. *p.* 356.
β: Calyx 2½—3-linearis. Corolla punicea, 6—7-linearis.
E. Pluknetiana. *Pl. Kew. t.* 9. optima.
E. Pluknetii. *Linn. Sp. Pl. ed.* 2. *p.* 506. excluſis ſynonymis.
γ: Calyx 1-linearis. Corolla albida, 3—3½-linearis.
E. Petiverii β. *Thunb. Diſſ. n.* 21.
δ: Calyx 2½-linearis. Corolla albida 3—3½-linearis.
In noſtro horto, cæteris elatior.
ε: Calyx 5-linearis. Corolla albida, 5-linearis.
Poſtrema varietas maxime inſignis eſt.

Fragilis; E. foliorum laminis acute mucronatis: corollâ 7—9-lineari; limbo recurvo-horizontali: pericarpio barbato.
E. Bankſia. *Andr. Er. n.* 26. *cum Ic.*
Sponte naſcentem in *Hottentots Holland*, locis rupeſtribus, legit F. Maſſon.

Veſtiflua, E. foliorum laminis incurvo-patentibus, junioribus piloſis: floribus ſolitariis: corollâ 7—9-lineari; tubo cylindraceo.
E. Petiveriana. *Roxb. MS.*
Corolla rufa.

Baculiflora, E. foliorum laminis recurvo-patentibus: floribus ſolitariis:

litariis: corollâ 6—8-lineari; tubo cylindraceo: pericarpio ovato.

Variat α: Corolla lutea.
E. Petiveri. *Linn. Mant. p.* 235. E. Petiveri. *Linn. Diſſ. n.* 50. *cum fig. floris.*
β: Corolla ſordide rufa.
E. Petiverii α. *Thunb. Diſſ. n.* 21.

Limbus Corollæ obtuſus, et inſtar affinium crenulatus in ipſo ſpecimine Linnæano.

E. foliorum laminis recurvo-patentibus; corollâ 7—9-lineari; tubo cylindraceo baſi ventricoſâ: pericarpio ovali. *Cothurnalis,*

Variat α: Bracteæ et Calyx glabriuſculæ.
E. Sebana. *Pl. Kew. t.* 10. optima. E. coccinea. *Linn. Sp. Pl. ed.* 2. *p.* 505. E. africana, &c. *Seb. Theſ. v.* 1. *p.* 32. *t.* 21. *f.* 4.
β: Bracteæ et Calyx pubeſcentes.
E. Pluknetii. *Berg. Pl. Cap. p.* 92.

Corolla in utraque læte rufa, et demum 4-angula.

E. foliorum laminis recurvo-patentibus: corollâ 4—6-lineari; tubo ovato-pyramidali: pericarpio ovato. *Socciflora.*

Variat α: Corolla lutea.
E. Sebana viridis. *Andr. Er. n.* 59. *cum Ic.* bonâ.
β: Corolla ſordide rufa.
E. Sebana ſordida. *Hortulanis.*
γ: Corolla læte punicea.

E. Petiveri. *Hortulanis.*

Limites, quibus ſtirpes ſub hoc et tribus præcedentibus titulis traditas diſtinguerem, vix inveni: omnes forſan rectius conjungendæ.

Furfuroſa, E. foliorum laminis incurvo-patentibus: corollâ 4—6-lineari, viſcidâ: filamentis latis: nectario cotyliformi.

E. monodelphia! *Andr. Er. n.* 22. *cum Ic.*

Filamenta forte latiſſima hujus generis.

Follicularis, E. foliorum laminis patentibus: floribus ſolitariis: corollâ 5—7-lineari, baſi inflatâ; nectario plinthiformi.

Variat α: Corollæ limbus mox ferrugineus.

E. Petiveriana. *Andr. Er. n.* 25. *cum Ic.* bonâ.

β: Corollæ Limbus mox atrobadius.

E. melaſtoma. *Andr. Er. n.* 43. *cum Ic.*

Folia penultima ultimaque baſi nonnihil dilatata.

Penicilliflora. E. corollâ 2-lineari, calyce obductâ; tubo ſphærico: antheris in penicillum acutum convergentibus.

E. Petiveri vera! *Hortulanis.*

Sponte naſcentem in *Hottentots Holland,* legit I. Mukler.

Pulchra ſpecies, bracteis calyceque niveis.

Placentæflora, E. foliis obtuſiſſimis: corollâ calyce obductâ: tubo rapæformi: filamentis ſenſim dilatatis: ſtigmate anguſto.

Sponte naſcentem in *Hottentots Holland,* legit F. Maſſon.

Herba pallidiſſime incana.

E. calyce

E. calyce bracteis imbricato: corollâ 1-lineari, longitudine calycis: antheris anguſtis, longis: pericarpio late gigartoideo. *Pyramidalis,*

E. imbricata. *Linn. Mant. p.* 372. E. imbricata. *Linn. Diſſ. n.* 53. *cum fig. floris.* E. quinquangularis. *Berg. Pl. Cap. p.* 117. E. imbricata. *Linn. Sp. Pl. ed.* 2. *p.* 503.

E. bracteis ſupra medium pedunculi ſparſulis: corollâ $\frac{2}{3}$-lineari, calyce breviore: antheris acuminulatis: pericarpio late ovato. *Squamæflora,*

E. imbricata. *Roxb. MS.*

Sponte naſcentem prope *Baay Fals,* legit I. Mulder.

E. calyce bracteis imbricato: corollâ $\frac{2}{3}$-lineari, calyce breviore: antheris obtuſis, ſepto lato: pericarpio ovato. *Cæſia,*

Communicavit *Thunberg.*

Stigma latiuſculum, quod in antecedente anguſtum.

E. bracteis ſupra medium pedunculi ſparſulis: corollâ 1-lineari, calyce longiore: antheris obtuſis ſepto anguſto: nectario grandi. *Flexuoſa,*

E. flexuoſa. *Andr. Er. n.* 33. *cum Ic.*

Sponte naſcentem juxta *Duyvelsberg* abunde, legit I. Mulder.

Pericarpium in hac turbinatum.

E. calyce bracteis imbricato: corollâ $\frac{2}{3}$-lineari, calyce *Laſciva,*

parum

parum breviore: antheris a basi foraminosis: stigmate peltato.

E. imbricata. *Thunb. Diss. n.* 11. auctoritate ejus specimînis.

Facile dignoscas, Antheris longe foraminosis.

Styloſa; E. pedunculis longis: bracteis juxta calycem sparsulis: corollâ 1-lineari, calyce parum longiore: antheris acuminulatis: pericarpio ovali.

E. bracteata. *Roxb. MS.*

Stylus longissimus.

Spirææflora; E. pedunculis glabris: corollâ 1—1½-lineari; limbo longitudine tubi, integerrimo: antheris juxta apicem foraminosis.

E. leucanthera. *Linn. Suppl. p.* 223.

Variat caule vix pubescente, et magnitudine florum.

Milleflora. E. caule tomentoso: corollâ ⅔-lineari; laciniis basi imbricatis: calcaribus linearibus, lævibus: stigmate exserto.

E. milleflora. *Berg. Pl. Cap. p.* 96. E. paniculata. *Linn. Sp. Pl. ed.* 2. *p.* 508.

Si quæ alia, legitima species: flores non paniculati, sed fasciculis trifloris terminalibus: a *Cyathiformi* stylo longe exserto dignoscenda.

Dioſmæfolia. E. foliis lucidis: corollâ 2-lineari; laciniis imbricatis: filamentis angustissimis: calcaribus exquisite attenuatis, serrulatis.

E. subserrata. *Roxb. MS.*

Sponte

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.
Folia latiora quam in plurimis.

E. caule angulato: foliorum laminis lanceolato-cuneatis: corollâ $1\frac{1}{3}$-lineari, calyce parum longiore: calcaribus auricularibus, glabris. *Palliiflora*;
E. candida. *Soland. MS.*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

E. foliorum laminis cuneatis: calyce obcuneato; corollâ $1\frac{3}{4}$-lineari; tubo parum 4-angulo, turbinato: calcaribus anguſte cuneatis. *Fugax*,
E. triflora ariſtata. *Wendl. Obſ. p.* 47. E. triflora. *Thunb. Diſſ. n.* 79. *cum Ic.* E. triflora. *Linn. Mant. p.* 374. E. triflora. *Linn. Diſſ. n.* 23. *cum fig. floris.*
Hujus ſpeciei floreſcentia citiſſime peragitur: non eſt triflora. *Linn. Sp. Pl.* quare nomen mutavi.

E. foliorum laminis cuneatis: calyce ovato-cuneato: corollâ 2-lineari; tubo valde 4-angulo, ſphærico: calcaribus late auricularibus. *Pyrolæflora*,
E. triflora. *Willd. Sp. Pl. v.* 2. *p.* 356. excluſis ſynonymis.
Sponte naſcentem infra *Duyvelſberg*, legit I. Mulder.
Perſimilis antecedenti, ſed accuratius inſpecta valde differt; tubo corollæ apice intus ſub ſinubus limbi, in tot carinas canaliculatas, extremitate pilis aliquot minutis barbatas, prominente.

E. foliorum laminis ovalibus, pubeſcentibus: corollâ $1\frac{1}{2}$-lineari; *Tegulæfolia*,

$1\frac{1}{2}$-lineari; tubo parum 4-angulo, turbinato: calcaribus grandibus, orbicularibus.

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Folia lata, et ordine recto imbricata.

Baccæformis. E. caule angulato: foliis ſæpius 4-nis: corollâ $2\frac{1}{3}$-lineari; tubo valde 4-angulo, turbinato: calcaribus auricularibus.

E. baccans. *Curt. Bot. Mag. n.* 358. E. baccans. *Linn. Mant. p.* 233. E. africana glabra fruticoſa arbuti flore. *Seb. Theſ. v.* 1. *p.* 32. *t.* 21. *f.* 3.

Folia interdum terna: quamobrem Corifoliam *Linn. Sp. Pl. ed.* 1 *et* 2. ad hanc quoque pertinere ſuſpicor.

Modeſta: E. foliis parvis, denſe imbricatis: corollâ $3\frac{1}{2}$-lineari, tomentoſâ; tubo late ovato; limbo recurvo: calcaribus lineari-attenuatis.

Communicavit *Hibbert.*

Flores pallidiſſime carnei.

Holoſericea: E. foliorum laminis argute reduplicatis: corollâ 3-lineari, holoſericeâ: tubo ovato: antheris hirtis.

Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Species pulcherrima, ab omnibus huc uſque cognitis corollâ ſuâ holoſericea facile dignoſcenda. Primo intuitu *Taxifoliæ* affinem eſſe putavi, longe autem differt, cum inflorescentiâ, tum numero bracteārum.

Glauca: E. foliis glaucis, ſucculentulis: corollâ 3-lineari, extus rorida: calcaribus ſuborbicularibus.

E. glauca. *Andr. Er. n.* 47. *cum Ic.*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.
Caulis 3-pedalis, teres. Folia 3-na, pene Sedi Reflexi Linn. laminis tamen ſubtus pubeſcentibus. Flores terminales. Pedunculi longi, una cum bracteis, calyce et corollâ omnes livido-purpurei. Stigma incluſum.

E. foliorum laminis lineari-attenuatis ovatiſque: calyce recurvo-patente: corollâ 7—9-lineari: pericarpio globoſo, 4-angulo. *Variifolia.*
E. Monſoniæ. *Pl. Kew. t.* 7. E. Monſoniana. *Thunb. Diſſ. n.* 52. *cum Ic.* E. Monſonia. *Linn. Suppl. p.* 223.

E. calyce adpreſſo: corollâ 7—8-lineari; limbo pyramidali, convoluto apice recurvulo: pericarpio hemiſphærico. *Rupeſtris.*
E. halicacaba. *Pl. Kew. t.* 2. E. halicacaba. *Thunb. Diſſ. n.* 51. auctoritate ejus ſpeciminis. E. halicacaba. *Linn. Diſſ. n.* 3. *cum fig. floris.* E. halicacaba. *Linn. Sp. Pl. ed.* 2. *p.* 507. E. halicacaba. *Linn. Amæn. Acad. v.* 5. *p.* 85.
Sponte naſcentem in *Taffelberg*, *Steenberg*, locis rupeſtribus, legit F. Maſſon.

E. calyce incurvo erecto: corollâ 8—10-lineari; tubo plus minus coſtato: filamentis muticis, baſi dilatatis. *Verſicolor*,
Variat α: Folia viridia. Corolla coccinea: tubo parum coſtato. Antheræ baſi recte emarginatæ.
E. verſicolor. *Andr. Er. n.* 12. *cum Ic.*

β: Folia viridia. Corolla ſaturate coccinea: tubo parum coſtato. Antheræ baſi ſurſum obliquæ.
Communicavit *G. Aiton*, princeps hortulanorum.

γ: Folia cæſia. Corolla ſaturate coccinea: tubo parum coſtato. Antheræ baſi ſurſum obliquæ.
E. diſcolor coccinea. *Hortulanis.*

δ: Folia cæſia. Corolla roſea: tubo valde coſtato. Antheræ baſi deorſum obliquæ.
E. coſtata. *Andr. Er. n.* 46. *cum Ic.*

Multas alias varietates nunc deſcribere ſuperſedeo.

Decora, E. calyce plano marginibus craſſis: corollâ 8—10-lineari, viſcido-pubeſcente; tubo clavato: calcaribus longis, pubeſcentibus.
E. Eweri. *Hortulanis.*
Flores pulcherrime roſeo-virides.

Cupreſſiformis, E. calyce adpreſſo: corollâ 9—11-lineari, glutine illitâ; tubo tenuiſſime ſtriato: calcaribus brevibus, glabris.
E. diſcolor. *Andr. Er. n.* 3. *cum Ic.* malâ.
Dignoſcas ab omnibus varietatibus *Verſicoloris*, filamentis anguſtioribus, et calcaratis.

Melliflua. E. bracteâ infimâ juxta baſin pedunculi: corollâ 9—12-lineari, lucidâ; tubo clavato, plus minus compreſſo: pericarpio ovato.

Variat

Variat α: Calyx valde ferratus. Corolla cruenta.
E. cruenta. *Pl. Kew. t.* 13. optima.
β: Calyx parum ferratus. Corolla punicea.
E. cruenta. *Andr. Er. n.* 17. *cum Ic.* E. cruenta. *Soland. in Ait. Hort. Kew. v. 2. p.* 16.
Posterior varietas est longe pulchrior, et robustior.

E. caule humifuso: foliis obtusis: corollâ 9—11-linearî, extus rorulentâ; tubo clavato, compresso: calcaribus longis. *Nana,*
E. depressa. *Hortulanis.*
Sponte nascentem in *Hottentots Holland,* locis rupestribus, legit F. Masson.
Floret *Octobri, Novembri.*
Persingularis est hæc Erica, flores grandes luteos cauli humillimo jungens.

E. foliis densissimis: calyce longe cuspidato: corollâ 6—8-lineari, glabrâ; tubo cylindraceo: calcaribus longis. *Spissifolia,*
E. Pattersonia. *Wendl. Er. fasc.* 1. *p.* 15. *cum Ic.* E. Pattersonia. *Andr. Er. n.* 7. *cum. Ic.* bonâ. E. abietina. *Linn. Diss. n.* 20. *cum fig. floris.* E. abietina. *Linn. Sp. Pl. ed.* 2. *p.* 506.
Sponte nascentem juxta *Cap Fals,* legit G. Paterson.

E. calyce late ovato, acuminulato: corollâ 6—8-lineari, glabrâ; tubo cylindraceo: calcaribus longis: antheris linearibus, valde papulosis. *Saccifiora,*
Sponte nascentem in *Hottentots Holland,* legit F. Masson.

Cylindriflora. E. foliis ciliatis ſetis decompoſitis: calyce recurvulo: corollâ 9-lineari, glabrâ: tubo cylindraceo: calcaribus brevibus.

E. ſerratifolia. *Andr. Er. n.* 36. *cum Ic.*

Filamenta in noſtris exemplaribus nunquam mutica.

Paludoſa, E. corollâ 7—9-lineari, pubeſcente, tubo parum clavato: antheris baſi roſtratis: pericarpio apice cotyligero.

E. abietina. *Andr. Er. n.* 64. *cum Ic.* E. concinna. *Schneev. Ic. n.* 31. E. concinna. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 23. E. verticillata. *Berg. Pl. Cap. p.* 99. E. africana erecta, paludoſa, &c. *Herm. Cat. Pl. Afr.*

Nomen antiquum, et hortulano utiliſſimum, reſtitui.

Lituiflora: E. calyce obovato: corollâ 6—8-lineari, pubeſcente; tubo valde clavato: filamentis dorſo apicis barbatis.

E. perſpicua. *Wendl. Er. faſc.* 1. *p.* 7. *cum Ic.* E. Linnæi! *Hortulanis.*

Pericarpium in hac, et antecedente, 6—8-loculare.

Obpyramidalis, E. corollâ $3\frac{1}{2}$—4-lineari, pubeſcente; tubo infundibuliformi; limbi interſtitiis extrorſum tumidis: pericarpio ſphærico.

E. pyramidalis. *Curt. Bot. Mag. n.* 366. *cum Ic.* E. pyramidalis. *Soland. in Ait. Hort. Kew. v.* 3. *p.* 401.

Sponte naſcentem juxta *Zwart Rivier,* locis humidis, legit F. Maſſon.

Ad ſtirpem vix naturalem, ſuum nomen propoſuit Solander,

lander, rami enim debiles, et penduli ſunt: itaque a tubo corollæ *Obpyramidalem* dixi.

E. caule tenui: corollâ 2½—3-lineari, pubeſcente: tubo anguſte campanulato; limbo brevi: filamentis muticis. *Cyrillæflora*;

Sponte naſcentem in *Hottentots Holland*, locis humidis, legit I. Mulder.

Flores pallide coccinei.

E. corollâ 2½—3-lineari, pubeſcente; tubo obovato; limbo recurvo-patente: calcaribus longis, argute cuneatis, parum ſerratis. *Velitaris.*

E. glabra. *Roxb. MS.*

Nomen noſtrum a foliis peranguſtis, Velitum jacula referentibus, petitum.

E. calyce ovato-cuneato: corollâ 7—8-lineari, pubeſcente; tubo cylindraceo-urceolari; limbo revoluto; pericarpio obpyramidali. *Culcitæflora*,

E. ſpuria. *And. Er. n.* 46. *cum It.*

Facies *Tubifloræ*, cui certo proxima, ſed nequaquam varietas. Filamenta evidenter calcarata, quæ mutica oſtendit figura citata.

E. pedunculis glabris: calyce anguſte lyrato: corollâ 9—10-lineari, pubeſcente: limbi interſtitiis baſi lanceolatis. *Tubiflora*,

Variat α: Corolla pallide carnea.

E. tubiflora.

E. tubiflora. *Linn. Diſſ. n.* 40. *cum fig. floris.*
E. tubiflora. *Linn. Sp. Pl. ed.* 2. *p.* 505.
β.: Corolla læte carnea.
E. coccinea. *Linn. Diſſ. n.* 42. *cum fig. floris.*
E. foliis, &c. *Linn. Hort. Cliff. p.* 148. *n.* 10.
Antheræ in poſtremâ varietate longius foraminoſæ.

Curviflora, E. pedunculis pubeſcentibus: calyce ovato-cuneato: corollâ 9-lineari, pubeſcente; limbi interſtitiis baſi lanceolatis.
E. ſimpliciflora. *Willd. Sp. Pl. v.* 2. *p.* 402. E. curviflora. *Linn. Syſt. Veg. ed.* 13. *p.* 305. auctoritate ipſius ſpeciminis.
Haud facile eſt hanc in herbariis a *Tubiflorâ* ſemper dignoſcere, etſi facies viva multum abludat: foliorum laminæ autem in hac conſtanter lineari-attenuatæ, in illâ lineari-lanceolatæ: flores inſuper rufi.

Cuſpidigera, E. pedunculis glabris: calyce ovato-cuſpidato: corollâ 11—12-lineari, pubeſcente; limbi interſtitiis baſi lanceolatis: antheris hirtis.
Sponte naſcentem juxta *Berg Rivier,* legit I. Mulder.
Filamenta rare villoſa.

Bibax, E. calycis foliolis imbricatis, inæqualibus: corollâ 8-lineari, pubeſcente; tubo valde clavato; laciniis baſi imbricatis.
E. curviflora. *Thunb. Diſſ. n.* 30. E. Flammea. *Hortulanis.*
Sponte naſcentem juxta *Palmit Rivier,* legit F. Maſſon.

E. pedunculis

E. pedunculis pubescentibus: corollâ 9—10-lineari, pubescente; limbo recurvo-patente: filamentis pubescentibus. *Buccinæformis,*
E. tubiflora. *Thunb. Diss. n.* 31.

E. pedunculis glabris: corollâ 10—11-lineari, glabrâ; limbo recurvo-patentissimo: pericarpio late turbinato. *Fastuosa.*
E. curviflora. *Wendl. Er. fasc.* 3. *p.* 7. *cum Ic.* E. curviflora. *Andr. Er. n.* 40. *cum Ic.* E. curviflora. *Linn. Diss. n.* 41. *cum fig. floris,* pessimâ.
Species in solo natali forsan procera, nam culta in quatuor annis jam quindecimpedalis est.

E. foliorum laminis hirsutis: pedunculis glabris: corollâ 10—11-lineari, hirsutâ: antheris rectis, papulosis. *Stagnalis,*
E. tubiflora. *Roxb. MS.*
Herba tota hirsuta est: cæterum facies sequentis, floribus pariter flavis.

E. pedunculis pubescentibus: calyce incurvo-erecto basi extus concavâ: corollâ 15-lineari, pubescente; limbo retuso. *Conspicua,*
E. conspicua. *Pl. Kew. t.* 12. optima. E. conspicua. *Andr. Er. n.* 29. *cum Ic.* E. conspicua. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 22.
Sponte nascentem prope *Stellenbosch,* legit F. Masson.

E. pedunculis glabris: calyce recurvo-patente basi extus convexâ: *Longiflora,*

convexâ: corollâ 18—20-lineari, pubeſcente; limbo obtuſo.

E. elata. *Hortulanis.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Herba, ſi probe obſervas, exquiſite pulverulenta.

Verticillaris, E. ramis verticillatis, lanatis: calyce incurvo-patente baſi extus concavâ: corollâ 9—11-lineari, rare lanatâ.

E. lanata. *Wendl. Obſ. p.* 45?

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Flores ſaturate rufo-fulvi.

Floccoſa. E. ramis ſparſis, lanatis: floribus ſæpius 1-riis: calyce adpreſſo baſi extus convexâ: corollâ 12-lineari, rare lanatâ.

E. ſordida. *Andr. Er. n.* 56. *cum Ic.* quæ revera titulo reſpondet. E. laniflora. *Wendl. Er. faſc.* 2. *p.* 23. *cum Ic.*

Affinis præ cæteris antecedenti: ſed differt omnino Habitu, Tempore florendi, Foliorum laminis recurvis reclinatiſve, Floribus ſæpius tantum ſolitariis, Corollis latioribus limbo magis revoluto, Antherarum valvis baſi ſurſum oblique emarginatis.

Radiiflora, E. petiolis anguſtiſſimis: corollâ 13-lineari, viſcidâ; tubo cylindraceo-urceolari apice ventricoſo: calcaribus ſubulatis.

E. octophylla. *Willd. Sp. Pl. v.* 2. *p.* 372. E. faſcicularis. *Willd. Sp. Pl. v.* 2. *p.* 372. E. faſcicularis. *Pl. Kew.*

Pl. Kew. t. 6. E. coronata. *Andr. Er. n.* 10. *cum Ic.* bonâ. E. octophylla. *Thunb. Diss. n.* 72. *cum Ic.* E. fascicularis. *Linn. Suppl. p.* 219.

Sponte nascentem juxta *Hottentots Holland Kloof*, legit F. Masson.

E. foliis hirsutis: corollâ 10—11-lineari, viscidâ; tubo cylindraceo-urceolari apice ventricoso: pericarpio stipitato. *Lycopodiifolia.*

E. Massoni. *Pl. Kew. t.* 18. cæteris longe antecellente. E. Massoni. *Curt. Bot. Mag. n.* 356. *cum Ic.* E. Massonia. *Andr. Er. n.* 9. *cum Ic.* E. Massoni. *Linn. Suppl. p.* 219.

E. foliorum laminis recurvis, acutis: corollâ 13—15-lineari, viscidâ; tubo infundibuliformi; laciniis ovato-cuneatis. *Pharetræformis,*

Variat α: Corolla aurantiaca.
E. exsurgens. *Andr. Er. n.* 13. *cum Ic.*
β: Corolla rutila.
E. abietina. *Roxb. MS.*

Dignoscas ab omnibus mihi visis, corollæ laciniis versus apicem attenuatis bifidulisque.

E. foliorum laminis reclinatis, obtusiusculis: corollâ 12—14-lineari, viscidâ; tubo clavato: filamentis exsertis. *Grandiflora;*

E. grandiflora. *Pl. Kew. t.* 8. E. grandiflora. *Curt. Bot. Mag. n.* 189. *cum Ic.* E. grandiflora. *Thunb.*

Diff. n. 28! auctoritate ejus ſpeciminis. E. grandiflora. *Linn. Suppl. p.* 223.

Sponte naſcentem juxta *Breede Rivier*, ſolo arenoſo, legit F. Maſſon.

Cerviciflora; E. corollâ 5—6-lineari, pubeſcentulâ; tubo anguſte urceolari; limbo patente: filamentis minute calcaratis.

E. inaperta. *Hortulanis.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Hæc ſpecies primâ vice adhuc parcius floruit, nec ejus inflorescentiam omnino intelligo, an revera hujus cohortis: bracteæ autem certo tres in ſingulis pedunculis.

Pinifolia, E. calycis foliolis imbricatis, longe cuſpidatis: corollâ 6—7-lineari, glabrâ; tubo clavato: filamentis calcaratis: pericarpio lævi.

E. pinea. *Thunb. Diff. n.* 26.

Sponte naſcentem prope *Baay Fals*, legit G. Robertſon.

Calamiformis, E. calyce adpreſſo: corollâ 9—10-lineari, glabrâ; tubo cylindraceo-urceolari; limbo recurvo: pericarpio lævi.

E. radiata. *Andr. Er. n.* 53. *cum Ic.*

Bracteæ infra medium pedunculi.

Longifolia, E. petiolis anguſtiſſimis: corollâ 9—11-lineari, pubeſcente; tubo plus minus clavato: filamentis ſæpius muticis: pericarpio ſuperne ſericeo.

Variat

Variat α: Corolla alba.
E. veſtita alba. *Andr. Er. n.* 20. *cum Ic.* E. veſtita. *Thunb. Diſſ. n.* 25.
β: Caulis coarctatus. Corolla alba.
E. pinifolia. *Hortulanis.*
γ: Caulis coarctatus. Corolla rubra.
E. pinifolia. *Roxb. MS.*
δ: Caulis valde craſſus. Corolla pallidiſſime carnea.
E. longifolia. *Pl. Kew. t.* 4. optima.
ε: Corolla purpurea.
E. veſtita purpurea. *Andr. Er. n.* 8. *cum Ic.*
ζ: Corolla coccinea.
E. veſtita coccinea. *Andr. Er. n.* 33. *cum Ic.*
E. veſtita coccinea. *Curt. Bot. Mag. n.* 402. *cum Ic.*
η: Caulis craſſus. Corolla carnea.
E. pinea. *Andr. Er. n.* 57. *cum Ic.*
In foliis omnium eſt etiam quædam differentia.

E. calyce adpreſſo: corollâ 5—6-lineari, viſcidâ; tubo clavato, coſtato: antheris juxta apicem foraminoſis. *Coſtæflora,*
E. Leea. *Andr. Er. n.* 20. *cum Ic.* bonâ.
Sponte naſcentem in *Hottentotæ Holland*, legit I. Mulder.

E. calyce apice recurvulo: corollâ 9—10-lineari, viſcidâ; tubo clavato, coſtato: antheris a medio foraminoſis. *Onoſmæflora,*
E glutinoſa. *Andr. Er. n.* 31. *cum Ic.* bonâ.
Flores ſulphurei.

Pulviniformis, E. foliorum laminis attenuatis, ferrulato-ciliatis: floribus in rudimentis ramorum longiusculis: corollâ 7—9-lineari, viscidâ; tubo cylindraceo-urceolari.

Sponte nascentem in *Hottentots Holland,* legit L. Mulder.

Faciem *Crinifoliæ* mire simulat, sed distinctissima est et inflorescentiâ, et filamentis, quæ prorsus mutica, atque instar sequentis pubescentia.

Frondosa, E. caule angulato: foliorum laminis attenuatis: calyce patulo: corollâ 9—10-lineari, viscidâ; tubo vix clavato.

E. coccinea. *Wendl. Er. fasc.* 3. *p.* 9. *cum Ic.* E. coccinea. *Andr. Er. n.* 41. *cum Ic.* E. coccinea. *Thunb. Diss. n.* 27. E. coccinea. *Berg. Pl. Cap. p.* 93. E. abietina. *Linn. Sp. Pl. ed.* 1. *p.* 355. E. foliis subulatis, &c. *Linn. Hort. Cliff. p.* 148. *n.* 9. auctoritate ipsius speciminis.

Sponte nascentem juxta *Baay Fals,* legit G. Paterson.

Phylicæfolia, E. caule tereti: foliorum laminis brevibus, parum attenuatis: calyce incurvo-erecto: corollâ 8—9-lineari, viscidâ; tubo vix clavato.

E. purpurea. *Andr. Er. n.* 4. *cum Ic.*

Sponte nascentem in *Hottentots Holland,* legit I. Mulder.

Diu hærebam animi dubius, an tantum pro varietate antecedentis proponerem: ob herbæ multas differentias, et calycem, tandem separavi.

Argutifolia. E. foliorum laminis valde attenuatis, argute reduplicatis:

tis: corollâ 5—6-lineari, viſcidâ; tubo infundibuliformi.
E. pulchella. *Thunb. Diſſ. n.* 24. *cum Ic.*
Neſcio quæ facies torva et ſcabra hanc ab affinibus primo intuitu diſtinguit.

E. pedunculis breviſſimis: calyce calloſo: foliolis rhombeo-ſpatulatis, integerrimis: corollâ 5—9-lineari, rorulentâ. *Favoſa,*
Variat α: Corolla 7—9-linearis; laciniis baſi contiguis.
E. ſpicata. *Wendl. Er. faſc.* 2. *p.* 27. E. ſpicata. *Thunb. Diſſ. n.* 71. *cum Ic.* E. ſeſſiliflora. *Linn. Suppl. p.* 222.
β: Corolla 5—7-linearis; laciniis baſi imbricatis.
E. ſpicata. *Andr. Er. n.* 6. *cum Ic.*
Infloreſcentia e collatione affinium ſpecierum tantummodo intelligenda, rudimentis ramulorum pedunculos ſimulantibus, veris pedunculis ſane omnium breviſſimis, aut nullis.

E. caule ſtricto: pedunculis breviſſimis: calyce calloſo, foliolis late ſpatulatis, inciſo-ſerratis: corollâ 7—10-lineari, rorulentâ. *Sceptriformis,*
E. enneaphylla. *Roxb. MS.*
Foliorum numerus ultra 4-narium, in toto genere valde inconſtans eſt.

E. pedunculis breviſſimis: calycis foliolis orbiculato-ſpatulatis, *Clavæflora,*

ſpatulatis, integerrimis: corollâ 10—12-lineari, rorulentâ.
Communicavit *Hibbert.*
Herba ad amuſſim ſequentis.

Alveiflora. E. pedunculis glabris: corollâ 7—9-lineari, rorulentâ; tubo cylindraceo-urceolari, inferne 4-angulo.
E. gelida. *Hortulanis.*
Sponte naſcentem in *Hottentots Holland*, ſolo humido, legit F. Maſſon.

Mammoſa. E. pedunculis pubeſcentibus: corollâ 8—10-lineari, rorulentâ; tubo cylindraceo-urceolari, juxta baſin 4-foſſo.
Variat α: Corolla coccinea.
E. verticillata. *Willd. Sp. Pl. v. 2. p. 370.* E. verticillata. *Andr. Er. n. 21. cum Ic.* E. ſpecioſa. *Schneev. Pl. n. 3. cum Ic.*
β: Corolla læte purpurea.
E. mammoſa. *Andr. Er. n. 58. cum Ic.* E. abietina. *Schneev. Pl. n. 23. cum Ic.* E. abietina. *Thunb. Diſſ. n. 68.* auctoritate ejus ſpeciminis. E. mammoſa. *Linn. Mant. p. 234.* E. mammoſa. *Linn. Diſſ. n. 21. cum fig. floris.* E. abietina. *Berg. Pl. Cap. p. 105.* auctoritate ejus ſpeciminis. E. folio Juniperi, &c. *Buxb. Cent. 4. p. 25. t. 41. 42.* E. african. arboreſcens, &c. *Barth. Act. v. 2. p. 57. cum Ic.*
γ: Corolla ſordide purpurea.
E. abietina. *Willd. Sp. Pl. v. 2. p. 369.*

Hæ

Hæ tres, et aliæ varietates, omnes ludunt ſtigmatibus interdum exſertis.

E. corollâ 6—8-lineari, utrinque hirſutâ; tubo curvo, pyramidali: antheris incluſis, longiſſimis. *Brachialis.*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.
Herba Sexfariæ.

E. foliorum laminis lineari-attenuatis, ſetis aſperſis: calyce cuneato: corollâ 4—6-lineari, extus totâ ſetoſâ. *Hyſtriciflora,*
E. Spaarmanni. *Thunb. Diſſ. n.* 33. E. Spaarmanni. *Linn. Suppl. p.* 219. E. Spaarmanni. *Linn. in Act. Holm.* 1778. *p.* 24. *t.* 2.
Sponte naſcentem juxta *Kromme Rivier*, legit A. Spaarman.

E. foliorum laminis ovato-cuneatis, breviter pectinatis: calyce cuneato: corollâ 6—7-lineari, extus verſus apicem ſetoſâ. *Strigilifolia,*
E. tranſparens. *Thunb. Prodr. p.* 71. E. cerinthoides γ. *Thunb. Diſſ. n.* 33.
Filamenta in hac calcarata.

E. foliorum laminis anguſte ovato-cuneatis, pectinatis: calyce rhombeo-ſpatulato: corollâ 5—7-lineari, intus lanatâ. *Pectinifolia,*
E. cerinthoides β. *Thunb. Diſſ. n.* 33.
Sponte naſcentem in *Lange Kloof*, legit F. Maſſon.

E. foliorum laminis lineari-lanceolatis, piloſis: calyce cuneato: corollâ 8—10-lineari, extus viſcido-piloſâ. *Criniſolia.*
E. cerinthoides. *Andr. Er. n.* 29. *cum Ic.* E. cerinthoides.

thoides. *Curt. Bot. Mag. n.* 220. *cum Ic.* E. cerinthoides α. *Thunb. Diſſ. n.* 33. E. cerinthoides. *Berg. Pl. Cap. p.* 104. E. cerinthoides. *Linn. Diſſ. n.* 43. *cum fig. floris.* E. cerinthoides. *Linn. Sp. Pl. ed.* 2. *p.* 505. E. coris folio, &c. *Breyn. Cent. p.* 25. *t.* 13. E. africana umbellata, &c. *Barth. Act. v.* 2. *p.* 57.

Ludit interdum una eademque ſtirps, corollis multo brevioribus, erectis, ſtigmate longe exſerto. Filamenta conſtanter calcarata ſunt, nec mutica.

Cernua. E. bracteis decurrentibus; calyce valde fimbriato: corollâ 2½-lineari; tubo globoſo: calcaribus auricularibus.

E. cernua. *Linn. Suppl. p.* 222. E. cernua. *Montin in Nov. Act. Upſ. v.* 2. *p.* 291. *t.* 9. *f.* 3.

Sponte naſcentem in *Koude Bockveldt*, legit F. Maſſon.

Doliiformis. E. foliis hirſutis: bracteis juxta calycem: corollâ 4—5-lineari, viſcidâ; tubo urceolari: calcaribus brevibus, cuneatis.

E. mammoſa. *Thunb. Diſſ. n.* 69. *cum fig.* in ed. noſtrâ.

Nulla mihi cognitæ affinis, niſi forte *Pallidæ.*

Piſtillaris. E. pedunculis foliolis gemmaceis obſitis: corollâ 3-lineari, lævi; tubo curvulo, infundibuliformi; limbo recurvo.

E. auſtralis. *Linn. Mant. p.* 231. E. coris folio 11. *Cluſ. Hiſt. Pl. lib.* 1. *p.* 42.

Semina ad hilum, appendiculam fungoſam exſerunt.

Ciliaris. E. foliorum laminis ovatis; corollâ 4-lineari, lævi; tubo ovato-pyramidali latere ſuperiore ventricoſiore.

E. ciliaris.

E. ciliaris. *Curt. Bot. Mag. n.* 484. *cum Ic.* bonâ. E. ciliaris. *Linn. Diff. n.* 39. *cum fig. floris.* E. ciliaris. *Linn. Sp. Pl. ed.* 1. *p.* 354. E. ciliaris. *Loefl. Ref. p.* 138. E. xii. *Clus. Hift. Pl. lib.* 1. *p.* 46.
Folia terna funt, at juxta fequentem in ferie naturali, ni fallor, locanda eft, ob corollæ fimilitudinem.

E. foliorum laminis ciliatis: calyce adpreffo: corollâ 3-lineari, apice extus pubefcente: calcaribus lanceolatis. *Botuliformis,*
E. Tetralix. *Curt. Fl. Lond. fafc.* 1. *t.* 21. bona. E. Tetralix. *Linn. Sp. Pl. ed.* 2. *p.* 507.

E. foliorum laminis fubtus bifulcis: calyce patente: corollâ $2\frac{1}{2}$-lineari, lævi: calcaribus auricularibus. *Multicaulis.*
E. ftricta. *Willd. Sp. Pl. v.* 2. *p.* 366.
Sponte nafcentem in Inf. *Corfica*, legit G. Jones.
Caules undique diffufi, nequaquam ftricti.

E. floribus caule nudo verticillatis: corollâ 3-lineari; tubo urceolari: calcaribus auricularibus. *Mutabilis.*
E. cinerea. *Curt. Fl. Lond. fafc.* 1. *t.* 25. bona. E. cinerea. *Linn. Sp. Pl. ed.* 2. *p.* 501. E. cinerea. *Loefl. Ref. p.* 137.
Flores purpurei, mox cum primum marcefcunt cærulei, ut defcripfit Loefling.

E. caule glabro: foliorum laminis recurvis, attenuatis: corollâ $1\frac{3}{4}$-lineari, obovatâ: calcaribus longiffimis. *Uncifolia.*
E. regerminans. *Linn. Mant. p.* 322.

Flores in rudimentis ramulorum axillaribus, nec racemosi: ad exemplar Linnæanum characterem concinnavi, nec in ullo alio herbario adhuc vidi.

Caduceifera. E. foliorum laminis cuneatis ovatisve: corollâ $\frac{2}{3}$-lineari: filamentis juxta medium calcaratis.

E. pulchella. *Andr. Er. n.* 51. *cum Ic.* mediocri. E. articularis. *Thunb. Diss. n.* 58. E. pulchella. *Houtt. Nat. Hist. v.* 4. *p.* 504. *t.* 23. *f.* 1.

Sponte nascentem in *Hottentots Holland*, legit F. Masson.

Hæc species, primum, veram insertionem calcarium *Ericarum* mihi docuit, cujus stamina Mercurii fabulosum caduceum lepide simulant: nempe in omnibus non ab antheris sed e filamentis ortum suum ducunt.

Empetrifolia, E. calyce tetraphyllo: corollâ-2-lineari, hirsutâ; tubo urceolari; limbo recurvo-patente: stigmate longe exserto.

E. empetrifolia. *Thunb. Diss. n.* 70. E. empetrifolia. *Linn. Mant. p.* 374. E. empetrifolia. *Linn. Diss. n.* 15. *cum fig. floris*, pessimâ.

Sponte nascentem juxta *Baay Fals*, legit F. Masson.

Malleolaris, E. calyce quadrifido: corollâ $1\frac{2}{3}$-lineari, lævi; tubo urceolari; limbo recurvo-patentissimo: pericarpio hirsuto.

E. empetrifolia. *Schneev. Pl. n.* 17. *cum Ic.* E. empetrifolia. *Houtt. Nat. Hist. v.* 4. *p.* 517. *t.* 23. *f.* 2. E. empetrifolia. *Berg. Pl. Cap. p.* 120. auctoritate ejus speciminis.

Herba antecedentis, sed flores diversissimi.

E. calyce

E. calyce quadrifido: corollâ 2-lineari, lævi; tubo obovato; limbo incurvo-patente: pericarpio hemisphærico, glabro. *Pyxidiflora.*

E. empetroides. *Hortulanis.*

Flores odorem ceræ Apum spirant.

E. calyce tetraphyllo: corollâ 2-lineari, lævi; tubo calathiformi; limbo recurvo-patente: stigmate incluso. *Nolæflora.*

Sponte nascentem in *Hottentots Holland*, legit F. Masson.

Pedunculi multo longiores quam affinium, floribus in meâ stirpe cultâ ultra folia extantibus.

E. caule valde angulato: foliis 4-nis: corollâ 2½-lineari, viscidâ; tubo anguste urceolari: filamentis muticis. *Festa.*

Sponte nascentem in *Hottentots Holland*, legit I. Mulder.

Flores fulvi: in cæteris hujusce cohortis mihi visis folia semper 5—6-na.

E. corollâ 2-lineari, viscidâ; tubo urceolari, parum costato: filamentis longitudine tubi, calcaratis: pericarpio viscido. *Fallax.*

Sponte nascentem in *Hottentots Holland*, legit F. Masson.

Antheræ 2-partitæ, vix tamen revera didymæ.

E. corollâ 3-lineari, viscidâ; tubo urceolari, parum costato: filamentis vix longitudine tubi, minute calcaratis. *Parilis.*

Sponte nascentem in *Hottentots Holland*, legit F. Masson.

Habitus prioris, sed præter calycis foliola basi angustiora, Antheræ duplo majores sunt, et calcaria filamenti apicem pene tota decurrunt.

Viſcida. E. corollâ 3-lineari, viſcidâ; tubo cyathiformi, coſtato: filamentis breviſſimis: pericarpio ſericeo.

Variat α: Folia incana, 1½—3 lineas longa.

E. viſcaria. *Thunb. Diſſ. n.* 40. E. viſcaria. *Linn. Mant. p.* 231. E. viſcaria. *Linn. Diſſ. n.* 46. *cum fig. floris*, peſſimâ.

β: Folia viridia, 3—5 lineas longa.

E. viſcaria. *Andr. Er. n.* 55. *cum Ic.* E. viſcaria. *Pl. Kew. t.* 1. optima, partibus diſſectis exceptis.

Facie admodum diſcrepant hæ varietates.

Catervæflora. E. caule angulato: corollâ 2-lineari, pubeſcente; tubo anguſte obovato: antheris longe foraminoſis.

E. pubeſcens 3. villoſa. *Thunb. Diſſ. n.* 61.

Sponte naſcentem in ſummitate *Taffelberg*, legit C. P. Thunberg.

Species legitima proculdubio, gravis enim eſt differentia caulis antherarumque.

Pubigera, E. calyce patente, ovato-acuminato: corollâ 1½-lineari, pubeſcente; limbo longiuſculo, recurvo: pericarpio hirto.

Communicavit *Hibbert.*

Facile dignoſcas limbo corollæ longiuſculo, recurvo, et penitus obtuſo.

Mitræformis, E. foliorum laminis parum reduplicatis, fimbriatis: corollâ 1¼-lineari, pubeſcente; limbo erecto: pericarpio glabro.

E. pubeſcens.

E. pubeſcens. *Andr. Er. n.* 60. *cum Ic.* E. hirtiflora. *Curt. in Bot. Mag. n.* 481. *cum Ic.* optimâ. E. pubeſcens 2 : hiſpida. *Thunb. Diſſ. n.* 61.

Folia aliquando ſparſula, cæterum, ut in ipſo ſpecimine Thunbergiano, quaterna.

E. calyce adpreſſo, anguſte ovato-cuneato : corollâ 1½-lineari, pubeſcente ; limbo breviſſimo, recurvo : pericarpio hirto. *Tardiflora,*

E. pubeſcens. *Curt. in Bot. Mag. n.* 480. *cum Ic.* optimâ.

Sponte naſcentem juxta *Taffelberg*, legit F. Maſſon.

Hanc ab antecedente probe diſtinxit *Curtis :* differt enim caule graciliore ; ramis floriferis multo brevioribus ; foliorum laminis magis incurvis, lateribus valde reduplicatis, integerrimis ; corollæ laciniis recurvis, latius imbricatis ; calcaribus anguſtioribus ; antheris glabris, foraminibus brevioribus ; denique feminibus ſcrobiculatis.

E. calyce adpreſſo, rhombeo-cuneato : corollâ 1½-lineari, pubeſcente ; calcaribus auricularibus : pericarpio glabro. *Parviflora,*

E. pubeſcens. *Linn. Diſſ. n.* 19. *cum fig. floris.* E. pubeſcens. *Berg. Pl. Cap. p.* 121. E. parviflora. *Linn. Sp. Pl. ed.* 2. *p.* 506.

Folia quaterna, laminis valde reduplicatis.

E. calyce adpreſſo, ovato-acuminato : corollâ 1-lineari, pubeſcente ; tubo ovali ; limbo breviſſimo : calcaribus lineari-attenuatis : pericarpio glabro. *Exigua.*

E. pubeſcens 4: parviflora. *Thunb. Diſſ. n.* 61.
Folia interdum terna, ſæpius quaterna.

Puſilla. E. calyce adpreſſo, late ovato-cuneato: corollâ ¼-lineari, pubeſcente; tubo calathiformi; limbo longitudine tubi: pericarpio glabro.
Sponte naſcentem prope *Baay Fals*, legit I. Mulder.
Non ſolum parvitate, ſed etiam proportione omnium partium floris, a cæteris hujus cohortis abludit.

Tragulifera; E. calyce imbricato: corollâ 2½-lineari; tubo urceolari; limbo recurvo: calcaribus hirſutis: antheris latiſſime foraminoſis, hirſutis.
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

Guttæflora, E. foliorum laminis lineari-attenuatis: corollâ 1—2½-lineari; laciniis apice guttâ illitis: calcaribus pubeſcentibus.
Variat α: Caulis faſtigiatus. Corolla 1—1½-linearis, tubo hemiſphærico. Stigma longe exſertum.
E. lateralis. *Willd. Sp. Pl. v.* 2. *p.* 380.
β: Caulis demiſſus. Corolla 2-linearis, tubo late ovato. Stigma breviter exſertum.
E. incarnata. *Andr. Er. n.* 27. *cum Ic.*
γ: Caulis demiſſus. Corolla 2½-linearis, tubo ovato. Stigma breviter exſertum.
E. rubens humilis. *Wendl. Er. faſc.* 3. *p.* 13. *cum Ic.*
Flores non vere axillares, ſed rudimentis ramulorum.

E. foliorum laminis linearibus: calyce adpreſſo: corollâ 1½-lineari; tubo ſphærico: calcaribus pubeſcentibus: ſtylo ſurſum curvo. *Curviroſtris,*

E. declinata. *Hortulanis.*

Frutex humilis, vix pro varietate prioris habendus, Antheris nimium diverſis. Flores gravem, et plane nauſeoſum odorem ſpargunt.

E. pedunculis glabris: calyce incurvo-patente: corollâ 1¾-lineari; tubo ſphærico: calcaribus auricularibus, glabris. *Obeſa,*

E. margaritacea. *Andr. Er. n.* 54. *cum Ic.* malâ. E. margaritacea. *Soland. in Ait. Hort. Kew. v.* 2. *p.* 20.

Sponte naſcentem juxta *Stellenboſch*, legit F. Maſſon.

E. calyce minuto: corollâ 1½-lineari; tubo ovali; limbo recurvo: calcaribus lineari-attenuatis, hirtis. *Gracilis,*

E. imbecilla. *Hortulanis.*

Caulis quamvis gracilis recte attollitur, minime imbecillis.

E. caule tenui: foliis verticillis remotis: corollâ 1½—2-lineari; tubo ovato-cylindraceo, ore lato: pericarpio hirto. *Intervallaris,*

E. elongata. *Roxb. MS.*

Species pulcherrima, ramulo fere omni floribus parvis, rubris, oblongis, nutantibus onuſto.

E. caule glabro: corollâ 1¼-lineari; tubo poculiformi; limbo erecto: calcaribus lanceolato-cuneatis, integerrimis. *Quadræflora,*

E. quadrangularis. *Prodr. p.* 297. Sponte

Sponte naſcentem in *Hottentots Holland,* legit I. Mulder. Flores inconſpicui, ſed in vaſto genere diſtinctiſſimi.

Prolifera, E. caule hirſuto: corollâ 1½-lineari; tubo cyathiformi; limbi interſtitiis acutis: calcaribus rectis: pericarpio hirto.

E. caffra. *Andr. Er. n.* 50. *cum Ic.* E. ſtrigoſa. *Wendl. Er. faſc.* 2. *p.* 25. *cum Ic.* E. ſtrigoſa. *Willd. Sp. Pl. v.* 2. *p.* 365. ſynonymo et deſcriptione excluſis. E. perſoluta 2. *Thunb. Diſſ. n.* 62. E. perſoluta. *Linn. Mant. p.* 230. E. perſoluta. *Linn. Diſſ. n.* 16. *cum fig. floris.* E. ſubdivaricata. *Berg. Pl. Cap. p.* 114.

Floreſcentiâ peractâ, rami plerumque e centro florum ultra producuntur.

Cyathiformis, E. pedunculis glabris: corollâ 1½-lineari; tubo cyathiformi; limbi interſtitiis acutis: calcaribus falcatis.

E. lævis. *Hortulanis.*

Valde affinis ſequenti, antheris pene ad amuſſim reſpondentibus: ob limbi interſtitia tamen ægre varietatem eſſe concedam.

Pelviformis. E. pedunculis rare pubeſcentibus: corollâ 1½-lineari; tubo pelviformi; limbi interſtitiis baſi ovalibus: calcaribus falcatis.

E. perſoluta. *Curt. in Bot. Mag. n.* 342. E. perſoluta 1. *Thunb. Diſſ. n.* 62. E. viridi-purpurea. *Linn. Diſſ. n.* 9. *cum fig. floris.* auctoritate ipſius ſpeciminis. E. mauritanica. *Linn. Syſt. Nat. ed.* 10. *p.* 1002.

Variat floribus albis, purpureis.

E, foliis

E. foliis anguſtis: calyce recurvo-horizontali: corollâ 2-lineari; tubo hemiſphærico; laciniis baſi imbricatis. *Turrigera,*

E. cupreſſina. *Hortulanis.*

Foliorum laminæ pene enerves videntur.

E. foliis latis: calyce reclinato-deflexo: corollâ 2½-lineari; tubo late ovato: limbi interſtitiis baſi ovatis. *Lacunæflora,*

E. Bergiana. *Wendl. Er. faſc. 2. p. 29. cum Ic.* E. quadriflora. *Willd. Sp. Pl. v. 2. p. 379.* E. Bergiana. *Schneev. Pl. n. 46. cum Ic.* E. Bergiana. *Linn. Mant. p. 235.* E. Bergiana. *Linn. Diſſ. n. 6. cum fig. floris,* peſſimâ.

Foliorum Laminæ evidenter 1-nerviæ.

E. bracteis minutiſſimis: calyce incurvo-deflexo: corollâ 2-lineari; tubo globoſo; laciniis baſi imbricatis. *Florida.*

E. florida. *Thunb. Diſſ. n.* 64.

In hac Calcaria lanceolata.

E. caule glabro: corollâ 1½-lineari, lævi; tubo turbinato, 8-angulo; limbo incurvo: calcaribus auricularibus, glabris. *Turbiniflora,*

Communicavit *Hibbert.*

Flores pallide purpurei.

E. caule viſcidulo: corollâ 1½-lineari; tubo ſphærico, valde 8-angulo: limbo recurvo-erecto: pericarpio hirto. *Bullularis,*

E. granulata. *Linn. Mant. p.* 234. E. ramentacea. *Linn. Mant. p.* 65. E. multumbellifera. *Berg. Pl. Cap. p.* 110. E. pilulifera. *Berg. Pl. Cap. p.* 111.

Mucoſa, E. caule glabro: corollâ 2-lineari, viſcidâ; tubo plus minus obovato; limbi interſtitiis parum tumidis.

E. mucoſa. *Pl. Kew. t.* 15. bona. E. mucoſa. *Linn. Mant. p.* 232. E. ferrea. *Berg. Pl. Cap. p.* 112.

Folia mire ludunt; laminis linearibus, lineari-lanceolatis, vel etiam ovalibus.

Piluliformis, E. foliis ſparſis: corollâ $2\frac{1}{2}$-lineari, lævi; tubo longitudine calycis: calcaribus lineari-attenuatis: pericarpio lævi.

E. nudicaulis. *Berg. Pl. Cap. p.* 113. E. pilulifera. *Linn. Sp. Pl. ed.* 2. *p.* 507.

Foliorum Laminæ reduplicaturâ minute ciliatæ.

Obliqua, E. foliis oblique verticillatis: ſpicis coarctatis: corollâ $3\frac{1}{2}$-lineari, viſcidâ; limbi interſtitiis in uncum tumidis.

E. obliqua. *Pl. Kew. t.* 3. optima. E. obliqua. *Thunb. Diſſ. n.* 73. *cum Ic.* bonâ.

Flores pallide purpurei.

Sequax, E. foliis teneris glutine arachnoideis: faſciculis 4—6-floris: corollâ 3—4-lineari, viſcidâ; limbi interſtitiis in uncum tumidis.

Variat α: Corolla 3-linearis; tubo late ovato.

E. phyſodes. *Thunb. Diſſ. n.* 89. E. phyſodes.

ſodes. *Linn. Diſſ. n.* 32. *cum fig.* E. phyſodes. *Berg. Pl. Cap. p.* 101. E. phyſodes. *Linn. Sp. Pl. ed.* 2. *p.* 506.

β: Corolla 4-linearis; tubo ovato.
E. phyſodes. *Andr. Er. n.* 44. *cum Ic.* E. phyſodes. *Curt. Bot. Mag. n.* 443. *cum Ic.*

Semina immatura tuberculata, poſtea tuberculis depreſſis evidenter ſcrobiculata.

E. foliorum laminis ovato-cuneatis: corollâ 4—5-lineari, viſcidâ; tubo urceolari; laciniis baſi imbricatis: filamentis latiſſimis. *Blenna.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.
Pulchra ſpecies, corollis luteis ore viridi.

E. foliis 4-nis: ſpicis coarctatis: corollâ 2½-lineari, lævi; tubo amphoræformi; limbo crenulato. *Verecunda.*

E. cernua. *Andr. Er. n.* 48. *cum Ic.*
Flores pallide carnei.

E. corollâ 2-lineari, glabra; tubo urceolari, parum 4-gono: calcaribus cuneatis, hirſutis: antheris hirſutis. *Pulchella.*

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.
Facies aliqua *Galiifloræ*, ſed veram ejus affinitatem adhuc neſcio.

E. foliorum laminis lineari-lanceolatis: ſpicis coarctatis: corollâ 4-lineari; tubo ſuperne admodum ventricoſo: antheris exſertis. *Embothriifolia,*

Communicavit *Hibbert.*

Nomen aptius e ſingulari figurâ corollæ forſan excogitandum: ſpecimen ſiccum tantum vidi.

Glutinoſa, E. foliis ſparſis: ſpicis coarctatis: corollâ 3—5-lineari, viſcidâ; tubo ovato-pyramidali: calcaribus auricularibus.

Variat α: Corolla 3-linearis.

E. glutinoſa. *Pl. Kew. t.* 17. optima. Chamæciſtus roris ſolis foliis. *Pet. Muſ. p.* 22. *t.* 161.

β: Corolla 5-linearis.

E. Droſeroides. *Andr. Er. n.* 30. *cum Ic.* E. glutinoſa. *Thunb. Diſſ. n.* 48. Andromeda droſeroides. *Linn. Mant. p.* 239. E. glutinoſa. *Berg. Pl. Cap. p.* 98. auctoritate ejus ſpeciminis.

Hujuſce generis eſt proculdubio, nec, quicquid ſuadeat Habitus, ad *Andromedam* referenda.

Curvifolia. E. foliis ternis: laminis recurvis: ſpicis coarctatis: corollâ 4-lineari, viſcidâ; tubo ovato-pyramidali: calcaribus lineari-attenuatis.

Sponte naſcentem in *Hottentots Holland,* legit I. Mulder.

Pericarpium minutiſſime hirtum.

Squarroſa, E. corollâ 5—6-lineari, viſcidâ: tubo ovato-pyramidali; limbo obtuſo: calcaribus marginalibus: antheris lævibus.

Sponte

Sponte naſcentem in *Lange Kloof*, legit F. Maſſon.
Folia denſiſſima.

E. corollâ 8—11-lineari, viſcidâ; tubo ovato-pyramidali; limbo acuto: filamentis muticis: antheris lanatis. *Gorteriæfolia*,

Variat α: Corolla 8—9-linearis.
In hac Tubus pene totus albus.
β: Corolla 10—11-linearis.
E. retorta. *Curt. Bot. Mag. n.* 362. *cum Ic.*
E. retorta. *Andr. Er. n.* 15. *cum Ic.*
E. retorta. *Thunb. Diſſ. n.* 91. E. retorta. *Linn. Suppl. p.* 220. E. retorta. *Montin. in Act. Holm.* 1774. *p.* 297. *t.* 7.

Herba ſimpliciter recurva: diverſiſſimam directionem exprimit nomen auctorum, quam in Ordine Naturali *Graminum* aliquando videas.

E. foliorum laminis lanceolato-cuneatis: corollâ 8—10-lineari, viſcidâ; tubo ampullæformi; limbo obtuſo. *Ampullæformis*,

E. ampullacea. *Andr. Er. n.* 34. *cum Ic.* E. ampullacea. *Curt. Bot. Mag. n.* 303. *cum Ic.* bonâ.

In hac cohorte, Antheræ apicibus incurvis et valde attenuatis conſimiles, fere dabunt characterem.

E. foliorum laminis ovato-cuneatis: corollâ 9—11-lineari, viſcidâ; tubo late ampullæformi; limbo retuſo. *Capax*,

E. prægnans. *Soland. MS.*
Sponte naſcentem in *Hottentots Holland*, legit F. Maſſon.

E. foliis

Lagenæformis, E. foliis 3-nis: corollâ 12—14-lineari, viſcidâ; tubo ovato apice ventricoſo; limbo tubo 4-plo breviore, ovato.

E. jaſminiflora! *Andr. Er. n.* 49. *cum Ic.* mediocri.

Sponte naſcentem in *Platte Kloof,* locis humidis, legit F. Maſſon.

Jaſminiflora. E. foliis 3-nis: corollâ 16—19-lineari, viſcidâ; tubo cylindraceo apice ventricoſo; limbo tubo 3-plo breviore, ovali.

E. Aitonia. *Curt. Bot. Mag. n.* 429. *cum Ic.* E. Aitonia. *Andr. Er. n.* 21. *cum Ic.* malâ. E. Jaſminiflora. *Prodr. p.* 293.

Flos ad amuſſim Jaſmini Grandiflori, *Linn.*

Pavettæflora, E. pedunculis breviſſimis: corollâ 9—10-lineari; limbo intus farinoſo: filamentis juxta apicem antheræ calcaratis.

E. infundibuliformis. *Roxb. MS.*

Communicavit *Hibbert:* ſplendidum donum, ejus nomine, ſi talia admittere potuiſſem, certe condecorandum. Calcaria etiam in hac potius e filamento, quam ipſâ antherâ, exſeruntur.

Faſciformis, E. pedunculis breviſſimis: corollâ 5—6-lineari; limbo intus farinoſo: filamentis muticis: antheris rectis.

E. faſtigiata. *Thunb. Diſſ. n.* 37. E. faſtigiata. *Linn. Diſſ. n.* 44. *cum fig. floris.* E. faſtigiata. *Linn. Mant. p.* 66.

Sponte naſcentem in *Platte Kloof,* legit F. Maſſon.

E. calyce minute ciliato: corollâ 5—6-lineari; tubo anguſte cylindraceo-urceolari; limbo breviſſimo; filamentis muticis. *Fiſtulæflora,*
E. cylindrica. *Thunb. Diſſ. n.* 39.
Pericarpium obovatum, glabrum.

E. caule glabro: corollâ 3-lineari; tubo anguſte pyramidali baſi planâ: calcaribus ſemilanceolatis: pericarpio obpyramidali. *Fragrans,*
E. Muſcari. *Andr. Er. n.* 1. *cum Ic.* mediocri.
Sponte naſcentem juxta torrentem in *Zout Rivier*, legit F. Maſſon.

E. caule pubeſcente: corollâ 2½-lineari; tubo ovato-pyramidali: calcaribus auriçularibus: pericarpio ſphærico. *Galiiflora,*
Variat α: Corolla albida.
E. tranſparens. *Berg. Pl. Cap. p.* 108.
β: Corolla rubra.
E. comoſa. *Pl. Kew. t.* 18. mala. E. comoſa. *Thunb. Diſſ. n.* 38. E. comoſa. *Linn. Diſſ. n.* 48. *cum fig. floris.* E. comoſa. *Linn. Mant. p.* 234.
Vox comoſus, prout uſurpatur apud Botanicos, in hanc ſpeciem minime quadrat.

E. caule pubeſcente: calyce obcuneato, ſerrato: corollâ 3-lineari; limbo tubo ½-breviore: calcaribus minutiſſimis, auricularibus. *Nidiflora,*
E. denticulata. *Roxb. MS.*

In

In hortis quoque confunditur cum ſequente, cui ſimilis: vix tamen pro varietate habenda, ob filamenta calcarata, et foramina antherarum breviora.

Denticularis, E. caule pubeſcente: calyce obcuneato, ſerrato: corollâ 3-lineari; limbo tubo ½-breviore: antheris longe foraminoſis.

E. dentata. *Thunb. Diſſ. n.* 39. E. denticularis. *Linn. Mant. p.* 22. auctoritate ſpeciminis ex Herbario Bergiano.

Flores purpurei.

Pulchra, E. caule glabro: calyce anguſte lanceolato, ſerrato: corollâ 4—5-lineari; limbo tubo duplo breviore: antheris breviter foraminoſis.

E. Walkeria. *Andr. Er. n.* 45. *cum Ic.* bonâ.

Daphniflora, E. calyce ovato-cuſpidato, vix ſerrato: corollâ 3-lineari; limbo tubo duplo breviore, recurvo-deflexo: filamentis muticis.

Sponte naſcentem in *Hottentots Holland*, legit I. Mulder.

Pellucida. E. caule gracili: calyce ſpatulato, ſerrato: corollâ 5—6-lineari; limbo tubo triplo breviore; filamentis muticis.

E. pellucida. *Soland. MS.*

Sponte naſcentem in *Hottentots Holland*, ſolo humido, legit F. Maſſon.

Caulis faſtigiatus, verticillis foliorum, in ramis vegetioribus, remotis. Foliorum Laminæ anguſtæ, lineari-attenuatæ.

attenuatæ. Corolla albida cum rubore aliquo, ita pellucida, ut literas tubo explanato ſubjectas facile diſtinguas.

E. bracteis duabus: corollâ 5—6-lineari; tubo ovato-pyramidali; limbo breviſſimo: calcaribus longiſſimis, ſubulatis. *Amabilis.*

E. inflata. *Thunb. Diſſ. n.* 67. *cum Ic.*

Species apud nos adhuc rariſſima.

E. bracteis duabus: corollâ 6—7-lineari; tubo ovato-pyramidali apice ventricoſulo: calcaribus breviſſimis, auricularibus. *Venuſta.*

E. ventricoſa. *Wendl. Er. faſc.* 3. *p.* 11. *cum Ic.* malâ. E. ventricoſa. *Curt. Bot. Mag. n.* 350. *cum Ic.* E. ventricoſa. *Andr. Er. n.* 2. *cum Ic.* E. ventricoſa. *Thunb. Diſſ. n.* 36. *cum Ic.*

Sponte naſcentem juxta *Franſche-Hoek*, legit F. Maſſon.

E. foliis 2-nis: calyce $1\frac{1}{2}$-lineari, anguſte ovato-cuneato: corollâ $2\frac{1}{2}$-lineari; tubo ovato-pyramidali: pericarpio obovato. *Imbellis.*

Variat α: Corolla albida.

β: Corolla pallide lutea.

γ: Corolla lutea.

E. lutea. *Wendl. Er. faſc.* 1. *p.* 13. *cum Ic.* E. lutea. *Andr. Er. n.* 11. *cum Ic.* E. lutea. *Thunb. Diſſ. n.* 49. E. lutea. *Linn. Diſſ. n.* 2. *cum fig. floris.* E. lutea. *Linn. Mant. p.* 234. E. lutea. *Berg. Pl. Cap. p.* 115.

Corollæ Laciniæ æquales ſunt: inæquales, ut deſcribit Willdenow, in toto genere haud ferme invenias.

Linifolia, E. foliis 2-nis: calyce 1½-lineari, late ovali-acuminulato: corollâ 2-lineari; tubo ovato: pericarpio turbinato.

Variat α: Corolla pallidiſſime rubra.

E. foliis lanceolatis oppoſitis imbricatis, &c. *Linn. Hort. Cliff. p.* 148.

β: Corolla læte rubra.

E. tenuifolia. *Linn. Diſſ. n.* 33. *cum fig. floris.* E. tenuifolia. *Berg. Pl. Cap. p.* 116. E. tenuifolia. *Linn. Sp. Pl. ed.* 2. *p.* 507. E. africana, altera, &c. *Seb. Theſ. v.* 1. *p.* 157. *t.* 73. *f.* 6.

Filamenta, æque ac in Imbelli, calcarata.

Borboniæfolia. E. foliis 2-nis: calyce 3½-lineari, late ovali-acuminulato: corollâ 3½-lineari; tubo ovato: pericarpio obovato.

Communicavit *Hibbert.*

Haſce tres, foliis 2-nis, puras legitimaſque eſſe ſpecies, minime pro certo affirmarem: calycis enim proportio, in quibuſdam aliis admodum variabilis.

Coriſolia, E. calyce reclinato-patente: corollâ 1½-lineari, calyci plus minus æquali; tubo urceolari; laciniis acutis.

E. articularis. *Curt. Bot. Mag. n.* 423. *cum Ic.* E. calycina. *Andr. Er. n.* 17. *cum Ic.* E. corifolia. *Thunb. Diſſ. n.* 77. E. corifolia. *Linn. Diſſ. n.* 26. *cum fig. floris tenelli,* peſſimâ. E. articularis. *Linn. Mant. p.* 65.

An ſit Corifolia *Sp. Pl. ed.* 2. ſolum ab Herbario Burmanniano diſcendum.

Obvallaris, E. bracteis grandibus, obovatis, ſupra medium pedunculi: corollâ 2-lineari; laciniis totis crenulatis.

E. bracteata.

E. bracteata. *Thunb. Diff. n.* 3.
Sponte naſcentem ad *Platte Kloof* montibus, legit C. P. Thunberg.
Filamenta certe calcarata.

E. foliorum laminis pube denſâ ciliatis: corollâ 2-lineari, verſus apicem hirtâ; laciniis criſpis, retuſis. *Hyſſopifolia,*
E. pigra. *Soland. MS.*
Sponte naſcentem juxta *Baay Fals*, legit G. Robertſon.
Bracteæ tantummodo duæ, ut in omnibus hujus cohortis: vicem tertiæ ſupplet folium pedunculo ſubjectum, dilatatum, et plerumque coloratum.

E. foliorum laminis reclinatis, acute mucronatis: corollâ 3-lineari; laciniis ovato-cuneatis, 2-fidulis. *Taxifolia.*
E. taxifolia. *Wendl. Er. faſc.* 2. *p.* 19. *cum Ic.* E. taxifolia. *Pl. Kew. t.* 19.
Calcaria in hac recte delineavit *Wendland:* hinc ab alio auctore ejus differentiam ſpecificam, quæ antheras muticas ſiſtit, concinnatam fuiſſe ſuſpicor.

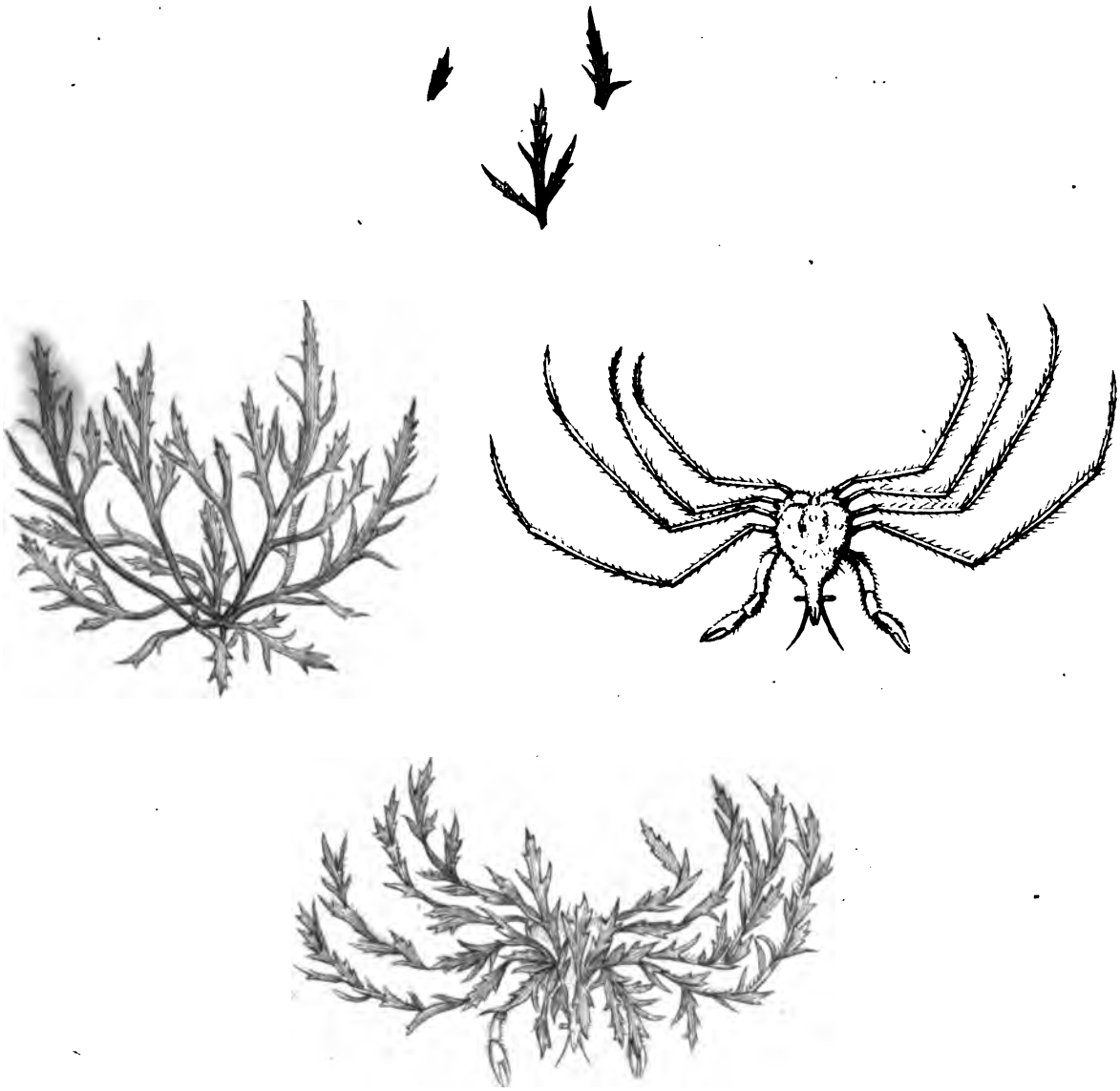
E. floribus in rudimentis axillaribus: calyce cuſpidato, longe ciliato: corollâ 4-lineari, pyramidali: antheris a medio foraminoſis. *Pugionifolia,*
E. tetragona. *Thunb. Diff. n.* 5. *cum Ic.*
Flores lutei.

E. floribus in rudimentis axillaribus: calyce acuminato: corollâ 3-lineari, ovatâ: antheris juxta apicem foraminoſis. *Viminalis.*

E. albens. *Curt. Bot. Mag. n.* 440. *cum Ic.* E. albens. *Linn. Diff. n.* 34. *cum fig. floris.* E. albens. *Linn. Mant. p.* 231.

Flores ochroleuci.

Paucula nunc in vacuo chartæ ſpatiolo, de noſtris nominibus, inſerere liceat. Satis ſcio, his temporibus periculum quid novandi: etiam doctiſſimos Botanicos, qui nullum, quantumvis licet abſurdum vocabulum, quod ipſi non antea irriſui damnaverint, mutari patiuntur. Tantis viris, me nil contra rationem unquam mutaſſe, modo reſpondeam: quibus autem hortulanorum gentis prudentiſſimæ nomina adulatoria magis placeant, omnibus iſtis religioſe a me citatis, prout cuique libido eſt, utantur.



J. Macculloch del.t 1800.

XXV. EXTRACTS *from the* MINUTE BOOK *of the Linnean Society.*

April 7, 1801. AN account was laid before the Society, from Dr. Macculloch, F. L. S. of an artifice uſed by the *Cancer Phalangium* to enſnare its prey. This contrivance conſiſts in the inſect dreſſing itſelf up, as it were, in fragments of a *Fucus* (the narrow-leaved variety of Hudſon's *ciliatus*), which it ſeems to cut off, and to attach to the long hairs of its body and legs by means of a glutinous ſubſtance. It thus imitates a perfect plant of that *Fucus* ſo accurately as to have deceived Dr. Macculloch. See TAB. XXXI.

Oct. 6. L. W. Dillwyn, Eſq. F. L. S. ſent information of his having diſcovered the *Syſimbrium murale* of Linnæus (a plant not hitherto noticed as of Britiſh growth) growing wild abundantly on the pier at Ramſgate and other places thereabouts. He believes it to be rather common throughout the iſle of Thanet.

Dec. 1. A letter from Dr. Walter Wade, of Dublin, A. L. S. to the Preſident, mentions his having found the *Eriocaulon ſeptangulare*, *Engl. Bot. v.* 11. *t.* 733, in Ireland. It has never before been ſeen but in the Iſle of Skye. Dr. Wade obſerved it laſt September, decorating the edges of all the lakes, great and ſmall, in the romantic mountainous diſtrict of Cunnamara, in the county of Galway. He remarked the number of angles in the ſtem to vary from 6 to 10, though moſt frequently

frequently 7, and that the generic and ſpecific characters accorded with thoſe given in *Engl. Bot.*

Dec. 15. Information was given that the late Dr. Pulteney, F. R. S. and L. S. had ordered his very valuable Muſæum of Natural Hiſtory to be preſented to the Society, on condition of its being preſerved as a ſeparate collection, in his name; and that he had alſo bequeathed to the Society the ſum of two hundred pounds ſtock, in the three per cent. conſolidated annuities.

CATA-

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Continued from Page 293 of Vol. V. of the Society's Tranſactions.

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464. Davy's (H.) Syllabus of a Courſe of Lectures on Chemiſtry at the Royal Inſtitution. Lond. 1802, 8vo.
465. Donn's (J.) Hortus Cantabrigienſis, ed. 2. Cambridge, 1800, 8vo.

466. Donovan's (E.) Epitome of the Natural Hiſtory of the Inſects of India, No. 1 to 7 Lond. 1800—2, 4to.
80. Dryander (J.) Catalogus Bibliothecæ Hiſtorico-Naturalis Joſephi Banks, tomus 5. Londini, 1800, 8vo.
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